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PINEAPPLES, ORANGES, CASSAVA, MANGOES, &c.

REPORT ON THE CULTIVATION OF

PINEAPPLES AND OTHER PRODUCTS OF FLORIDA.

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HAVING recently visited Florida, on account of Messrs. Elder, Dempster & Co., for the purpose of acquiring information relative to the methods of pineapple cultivation so successfully pursued in that State, I have the pleasure to report accordingly. In addition to Pineapples I embraced the opportunity of investigating other important cultures in Florida capable of being turned to good account in Jamaica. The resourcefulness of the people there in developing new Industries greatly impressed me throughout my trip. They have little beyond tropical sun and sand at their disposal. For success they depend upon their characteristic energy, industry and perseverance. With these traits they transform the barren resources of the soil.

Before leaving for Florida, I called at Washington, where I had the honour of an interview with the Honourable James Wilson, Secretary of Agriculture in the Cabinet of Mr. McKinley (with the Secretary I may mention I had recently been in communication relative to tho cultivation of new products.) I was welcomed with the utmost consideration and introduced to the Chiefs of Bureaus of the Department, eminent specialists, who most generously placed at my disposal every source of information. Professor Webber, the well-known expert on hybridization, preparod my itinerary with references to the leading cultivators in Florida, whom he thought might be most useful to me in my line of investigation, It is only necessary to say that the exceptional attention I received everywhere, placed me in a position to acquire valuable information. In this connection I wish to offer my sincere thanks to Professor B. T. Galloway, Chief of the Bureau of Plant Industry as well as to Professor Webber.

ORLANDO tho first pineapple region I visited, is situated on the most northern latitude at which pineapples are grown in Florida.

Until about 12 years ago the pineapples were cultivated in the open without protection, but the recurrent frosts rendered the cultivation too precarious, for the slightest touch of frost ruined a year's crop.

My references for Washington included one to the pioneer of a new system of pineapple cultivation Acres of sheds were constructed by this pioneer (Mr. Russell) and he commanded success. This system of cultivation is now exclusively adopted at Orlando, partly to afford protection from frost and partly to screen the pineries from the burning sun. Thus numerous pineries, ranging in size from one to twelve acres, are closely boarded all round 7 to 8 feet high. At regular distances posts are placed some 12ft. apart, on which are fixed connecting rods ; on these are placed narrow rafters, between each of which a space similar in width is left for the admission of light. Through these spaces the light is admitted in glittering rays of sunshine, ample, it is abundantly proved, for the well being of the plants. A still more remark.

able feature of cultivation is demonstrated under these sheds, one that further exemplifies the constitutional flexibility of this plant. During several months of winter when frost is dreaded, when every hour of night is watched for possible disaster by all concerned, the whole of this shed structure is covered with canvas, sometimes even with laths fitted interstices of the fixed roof laths, with the result that all the plants in the interior are shrouded in comparative darkness for several months. Within this covered roof when the thermometer falls to about 400 in a two acre pinery a hundred fires are lighted, sometimes stoves. The smoke from the fires combats the frost, though the plants frequently suffer from the smoke.

In one instance last winter one of the best growers risked his one and a half acre pinery throughout the winter without using canvas. He experienced many a sleepless night, but there was no frost, and he said he had stolen a march upon his neighbours from the fact that his plants looked much better than those that were covered. However the other pineries that were darkened, bore crops just as well as his. Thus the dark treatment does not effect the accommodating powers of the plant. The cultivation under sheds is a remarkable success, it is not only perfect garden cultivation, but it rivals the most skilfully conducted green-house cultivation. Nine thousand are planted to the acre, every plant practically speaking flourishes. It is not uncommon to see a pinery with 95 per cent. bearing fruit. The average is 80 per cent. The soil is an important factor. It is nearly all sand containing as it does from 96 to 98 per cent. of silica. The growers furnish all the food by fertilizers which bring forth luxuriant crops; The fertilizers are manipulated and applied with scientific precision, just what is desired to ensure complete productiveness. There are altogether about 200 acres of cultivation under sheds. Large extensions are made annually. At the time of my visit there was one application for 100,000 suckers. A one-acre or a two-acre shed (and there are many such) is considered a lucrative investment for a small capitalist. The larger cultivators have sheds occupying from 5 to 12 acres each.

The cost of erecting sheds per acre averages fully $300 and for the canvas as much more. They last about 7 years. Suckers cost 10 cents each, 9,000 per acre ($900). The fertilizers cost about $100 per acre annually. Thus an acre costs fully $2,000 on the first crop. The first crop in about 20 months covers all expenses. The range of prices obtained is from 20 to 75 cents each. This is for "fancy" fruit, practically all Smooth Cayenne. The net profit is stated to be about 40 per cent. The leading cultivators nett more than $3 per crate averaging 16 fruits. Some of the growers replant, after reaping each crop, some after two crops.

Throughout the year, even during the cool season, the sun shines with tropical brilliancy. During most of the year the temperature approximates to that experienced in Jamaica. During my stay it was higher than it is in Jamaica at any time. The average rainfall for 7 years has been 49 inches and it is evenly distributed. The suckers are set in long beds usually with 7 in the cross rows 18 inches apart and from 22 to 24 inches between the rows. The sandy soil is kept perfectly free from weeds by means a scuffle hoe every fortnight, with which also the fertilizers are turned in two or three times a year. This hoe is worked from the passages on either side of the bed.

Notwithstanding the sandy character of the soil, forests of pine trees covered the land anterior to cultivation. Oak trees are also dispersed here and there. The inference to be drawn from the presence of these and other trees, is that there is more stamina in the soil than is apparent. However the trees penetrate to a considerable depth. Certain varieties of Peaches and Pears flourish in the open when fertilizers are applied. Maize is cultivated on selected spots and yields 15 bushels per acre. In most parts the sandy soil is very deep.

The fruiting season is affected by shed cultivation. Crops are obtained to some extent at the time desired by the cultivator according to the time of planting, The principal season is in August and September. A grower informed me that the "Smooth Cayenne has the great advantage of blooming any time." The plants that bloom in the summer here produce finer fruit than the ones that bloom in the cool Spring. The size of the crates used by the Florida Fancy Pineapple Association is 12 by 20 by 24 inches, number of fruit 10, 12, 14 and 16.

The growers claim that the fruit from the sheds is superior to that grown in the Azores under glass, where the same variety is cultivated. One grower had a fresh stock of suckers which he imported from the Azores for propagating purposes.

JENSEN on the Indian River is situated much further south, about 27° on the east coast. Here are vast fields, many miles of solid cultivation. Altogether there are several thousand acres cultivated on either side of the railway, Perhaps there is no such concentrated area of equal extent under sugar cane cultivation in Jamaica.

The pioneer pineapple cultivator here, indeed pioneer cultivator on the Peninsula of Florida, Captain Richards, gave me an historical account of his initial experiments; how he 18 years ago (at that time the district was a wilderness) brought the first schooner load containing 40,000 suckers from the Key islands, how they failed except a limited number, as he knew not how to treat them in the changed conditions of soil. He returned to the Keys for another schooner load. He persevered amidst the greatest difficulties. Mosquitoes were awful, heads and faces had to be shielded by a netted contrivance. His first shipment to New York attracted great attention. A son is now a large grower, shipping from 8,000 to 10,000 crates per year (average per crate 30). This veteran is at present experimenting with Pineapple wines, etc.

This is the greatest Pineapple region in the world; about 200,000 crates containing six million fruits are shipped to the northern cities annually, and plantations are constantly being extended. Practically all the plants cultivated are the red Spanish variety. This variety is generally admitted to be inferior in quality to several others, but growers claim that "it is the hardiest, easiest to cultivate and best suited to varying conditions." The Jamaica Ripley is well known amongst growers and is considered the most luscious of fruits, but though repeatedly tried it has not been successfully cultivated. The Smooth Cayenne is cultivated in the open to a small extent but not quite satisfactorily.

For a long period of years frost was unknown here, but the calamitous freeze of 1894-1895, destroyed all the plantations and ruined most of the planters. However most of the growers were determined to resist all obstacles,—the class of men that make a nation prosperous. They obtained from the Keys and the Bahamas fresh supplies of suckers and made new plantations. Another freeze two years ago, much less severe than the previous one, committed considerable destruction; suckers sprang up from the ground this time. Some pineries suffered more than others. From year to year the growers live in terror of the return of this disaster, though they look forward to comparative exemption from frost upon their devoted culture.

The soil here is practically the same as that at Orlando. The soil is a mystery, chemically and physically; it is not known how Pineapples can grow in soil which is practically devoid of plant food. "Just how it is that the pineapple can thrive in such soil that seems to be exceedingly deficient in all the necessary qualifications of good land has not been explained. It will probably be necessary to institute careful physiological experiments with the plants itself before the matter shall be thoroughly understood." Again I quote from the Agricultural experiment station Report "we have here a plant that increases in size during the period of greatest drought, when there may be no rain for 6, 8, and at times 10 weeks, in a soil containing 99.44per cent. of insoluble residue!"

The average area of each pinery is from 20 to 60 acres. I noticed that the smaller areas were under much better cultivation than the larger. This is what might be expected, when it is remembered that a 60 acres pinery contains some 7,00.000 plants. Throughout these thousands of acres of pineries weeds are conspicuous by their absence. They are carefully suppressed in the early stage of cultivation. The plants are set about 18 to 22 inches apart, some 12,000 to the acre, including passages. This extremely close planting is considered advantageous.

It is claimed that this dense mass not only supports the plants and fruit, but that it prevents the growth of weeds. The first crop is obtained in about 20 months, and at this stage the fields present a fine symmetrical appearance. For the second and subsequent crops, a couple of suckers are left to each plant; this aggregates into a dense mass of plants after the first crop is harvested, so much so that one wonders how the fruit is cropped. Each sucker yields a fruit, so that greatly augmented crops are obtained. From the period of planting the cultivation is kept up from 8 to 10 years. I noted that they passed their prime in 4 years, hence frequent replanting would be better, but a crop at least is lost by replanting, and when they are densely massed a touch of frost affects them less than it does those wider apart. The 12,000 plants per acre is estimated to yield from 8,000 to 9,000 fruit per acre. These with the additional suckers yield from 9,000 up to as many as 15,000 per acre. I have frequently counted 8 and 10 fruits on a square yard. One man reaped 600 crates per acre this year, though some growers got less than 200 crates per acre, and this may be put down as the general average.

The great bulk of the crop is harvested in June. Last June the growers were unfortunate in having heavy rains (17 inches) which affected the keeping quality of a considerable number of fruits. Not long before they experienced a drought, the fruit was smaller on this account. The fruit when packed is sent by rail to Jacksonville the great distributing centre of Florida, —one day for this. They are then transferred to other trains for the north,—3 days more. When packed in the trains, a space is left between the crates for ventilation.

The standard size of the crate is 10½ by 12 by 36 inches, two divisions. A crate holds 18 large fruits, next sizes 24, 30, 36, 42 and 48. Average size 30. The 48's are so small that they are hardly worth shipping. Before packing each fruit is wrapped with paper.

The average amount netted per acre is about $400. "We have had from one acre of pines containing 10,000 plants 250 crates averaging 30 to the crate, or 7 500 pineapples, netting us over transportation. commission, &c. $2 per crate or $500 for the acre." Others state that 100 % profit is realized.

The importance of ammonia and potash are constantly discussed, and potash applied at the fruiting season is said to improve the keeping qualities of the fruit. The fertilizers are mixed by the grower to suit his own opinion as to the relative merits of each ingredient. Certain fertilizers are simply thrown over the tops of the plants, but wherever practicable between them. The cost of fertilizer ranges from about $50 to $100 per acre per annum.

Many vegetable forms here are purely tropical, including some of our West Indian species, intermingled with scrubby oaks, &c. Innumerable trees were completely destroyed by the great freeze that swept desolation over Florida. The cool winter season here, barring frost, is quite favourable to many tropical plants. This is accentuated by the cloudless sky. The rainfall averages about 60 inches. Amongst tropical fruits that flourish here may be mentioned the mango and the avocado pear. This indicates the nature of the climate. The characteristic vegetation is the spruce pine and the beautiful palmetto which is distributed in vast numbers. Thus the two great representatives of northern and southern latitudes appear in companionship.

Besides the open system of pineapple cultivation so extensively carried on here, the Orlando shed system has been inaugurated since the great freeze of 1895, and so successfully that there is already about the same area of sheds as at Orlando, about 200 acres, and they are in point of size much larger here. Dozens of acres are being extended at a cost of more than $300 per acre. Peaches thrive in the sheds but not outside. The Jensen (Indian River) growers cultivate the red spanish pine under sheds in contra-distinction to the Orlando growers with their smooth cayenne. As already stated frosts are less frequent and less severe than at Orlando but the temperature falls to danger point under 40° from time to time, when the plants begin to suffer. No canvas covering or fires are used here. It is found that on a cold morning, the sheds conserve the temperature to the extent of a few degrees. This is important in itself, but other great advantages accrue by the adoption of this great plant growing contrivance. The Red Spanish plants grow far more luxuriantly therein, the fruit is one third larger and it is decidedly improved in flavour, and the plants are cultivated with considerably less fertilising ingredients. Fruit burning is also obviated. Careful observation of the open fields and of the shedded fields side by side, conclusively prove the far great luxuriance and more perfect cultivation under the latter. The adoption of this system of cultivation is quite as important for the Red Spanish variety as it is for the Smooth Cayenne.

The shed method has thus brought to light new cultural possibilities of the pineapple. Darkness during several months of winter at Orlando does not interfere with the perfect cultivation of the plant. Interrupted sunshine throughout the year by means of sheds for both varieties, enhances the luxuriance, productiveness, size and flavour of the fruit, and the cost of fertilising is materially reduced thereby. One great grower to whom I was referred by the Department of Agriculture informed me in the presence of another leading grower, that if he had from the first, confined his attention to 10 acres of sheds, he could have done better than by cultivating 60 acres in the open. Most of his cultivation is now under sheds. And the consensus of opinion is markedly in favour of shed culture. The same grower declared that more money is made out of the Red Spanish, than from the fancy fruit at Orlando, the demand for them being infinitely g eater by reason of cheapness.

Oranges too, succeed perfectly in sheds, but the lofty structures requisite are very expensive. I have seen dozens of acres. Horticulturally the system ensures the most vigorous development of plants. At the great Hotels at Palm Beach, &c., ornamental plants are extensively cultivated in sheds. A notable instance of the importance of shed cultivation was expounded to me at Washington on my return from Florida. One of the experts at the Agricultural Department thus called my attention to the fact that in the vicinity of Tampa on the west coast the shed system for cultivating Tobacco, is adopted with remarkable results, both as to quality and quantity "the crop is so valuable that the land is now covered with cheese cloth placed on wood framed 9 ft. high." In Jamaica, under sheds Tobacco may become an important industry. The quantity per acre would be greatly augmented as well as improved in quality, and it can be grown in places where it cannot be grown successfully without sheds.

The conclusions I arrived at with regard to the actual benefit conferred on plants by the adoption of shed cultivation are as follows:—It mitigates the fierce burning rays of a tropical sun upon plant life. It prevents continuous and excessive evaporation. It interrupts the force of winds which conduces to increased evaporation and aridity. Thus the whole mass of plants within creates atmospheric conditions of their own, conditions which are suffused throughout the shed.

PINEAPPLES ON THE KEYS.

From the port of Miami 25° 70′ I proceeded in a schooner to Elliot Key, and Key Largo, the latter about 25° 20′ to examine the methods of cultivation adopted there. Hundreds of Acres are under cultivation on these islands since about 1860 when they were introduced. On the keys an absolutely different system of cultivation is carried on. The plants are grown among the coralline rocks, between the crevices, the crow bar being used to open the crevices for the plants. The vegetation on the rocks consists of small scrubby trees. This is cut down and burnt. An inch or two of decayed vegetable matter covers most of the rocks. About a year after clearing this soil is completely washed into the crevices so that on some plantations earth is invisible, the entire surface being rock difficult to walk over. In other places there are small collections of humus interspersed among the rocks. The suckers are actually planted to the extent of 1,500 dozens to the acre (18,000.) The cultivation of each pinery is kept up about 5 years. Fertilizers are not used. The cultivators have the great advantage of having their fruit a few weeks earlier in the market, than those cultivated on the mainland and consequently realise a higher price. There can be little doubt that the earlier crop, arises from the high temperature emanated by the rock.

HYBRID PINEAPPLES.

During my interview with Professor Webber, the eminent Chief of Hybridization at Washington, on my way to Florida, I had the gratification of seeing the first hybrid Pineapple fruit. The first product of a new type of Pineapple; the result of many years of devoted skill; a new departure in the history of this fruit. This precious specimen created intense interest.

On my return to Washington from Florida, I was informed by the Chief of the Bureau of Plant Industry, by this time other hybrid fruits each distinctly different had been received from the Experiment Station in Florida; that the flavour of several of the types was extremely satisfactory.

At Miami I visited the Government Experiment Station where these fruits were grown, and saw the plant that gave the first fruit; there are about 300 hybrid plants altogether. Over a dozen had ripened fruit by the middle of July, and many more were coming to maturity. Each plant so far yields distinctly different forms, so that they will be numerous. Some of course will be superior to others Those that have fruited are producing suckers for multiplication. It is also interesting to record the fact that many of these plants are smooth leaved, spineless, an important consideration from the grower's point of view, for it enables him to traverse his fields with great facility as compared with struggling through the spiny masses of leaves. It is further incresting to relate that the acquisition of smooth foliage was preconceived in the hybridizing operations, in view of its advantageous results. It was a source of pleasure to me to behold these precious achievements. In the near future we shall obtain specimens; for it may not be amiss to say, the Chief of the Bureau offered me most generously everything that can be spared by the Department. There can be no doubt that these important acquisitions are destined to advance the pineapple Industry and extend its popularity everywhere.

I am glad to say I have received seeds from another source of rare varieties which I have sown and hope to grow for further experimental purposes. At the station mentioned there are also many new types of hybridized Oranges the merits of which are as yet unknown, not having borne fruit. Guavas are also hybridized here and many other tropical plants are experimented upon.

PINEAPPLES IN JAMAICA.

The number of fruits exported from Jamaica average only about 65,000 a year. This is what Florida grows on 10 acres. Quite recently the cultivation has received increased attention and judging from the area planted at least 400,000 should be exported very soon. Even this number however is closely approximated by individual growers in Florida. It will remain an insignificant industry until we export millions annually.

Much of the cultivation is far from satisfactory. Small patches have been successfully cultivated but I suspect there is hardly any cultivator of an acre or two who has not been greatly disappointed. Probably we have had about 100 acres in cultivation for years, yet the export figures only show what is capable of being cultivated on 10 acres. The condition of the soil in Jamaica is the perplexing element. This is the secret of Florida's success. Intermediate between that barren sand and the ordinary soil of Jamaica, we have to strike the best possible medium. In other words to ensure success for this culture, the soil selected must be peculiarly sandy, gravelly or rocky even to the extent of impoverishment in the natural supply of plant food, which deficiency can be advantageously added according to the requirements of the soil.

As stated, in Florida soil is the all important factor and in order to make this cultivation successful in Jamaica on a large scale, soil is the important consideration.

There can be no doubt that the kinds best adapted to cultivation in Jamaica are the acclimatized varieties. The Smooth Cayenne, which by the way I introduced to Jamaica 30 years ago, is less successfully grown than the others. It seems to grow too luxuriantly, all into rank foliage. More sterile conditions of soil should remedy this.

Messrs. Elder Dempster & Co, have with a view to improve and establish this cultivation on a commercial scale decided to cultivate several acres on the Liguanea Plain under my supervision. My long experience in tropical agriculture, coupled with the advantages accruing from a careful study of this culture in Florida, where during my sojourn on the great pineapple fields I acquired much information, will enable me to turn to practical account improved methods of cultivation, the application to our most suitable land of the accumulated knowledge of Florida. I therefore hope to be able to instruct intending cultivators as to the most approved soils and methods applicable to Jamaica.

Pineapples are exposed in Jamaica to the burning sun throughout the year far more than is the case in Florida. I feel convinced that the inauguration of the shed sytem merits attention for the purpose of warding off the full blaze of the sun and for securing congenial atmospheric conditions. I therefore beg to suggest that I may be empowered to make an experimental trial of a one acre shed, 2 or 3 of the best varieties to be cultivated. On the dry Liguanea Plain, in places where the soil is extremely sandy, I am of opinion that these sheds will prove in valuable. To cover an acre with laths costs about $300 per acre in Florida. There timber is cheap. We have bamboo which doubtless will answer the purpose perfectly, and it is cheap. Of this material I purpose making my experimental shed. Possibly creepers trained on wires might be substituted for laths eventually. The remarkable improvement appertaining to the pineapples under sheds in Florida can probably be attained by cultivation under sheds here. Thus the Ripley, judging from Floridian experiences, will be considerably augmented in size and improved in quality (a little difference in the size of the fruit doubles its value) and the fruiting season is in some measure regulated by shed culture. In Florida, as already stated, no expense is spared to ensure these conditions. Such a valuable crop is worthy of any improvement of soil, &c.

With regard to this cultivation on the rocks of the keys, similar rocky land abounds in Jamaica,—extensive areas under rank bush and considered uncultivable. These wastes with sufficient rain can be converted into pineapple fields. Little capital is requisite beyond what is necessary for the purchase of suckers. One man can cultivate several acres. Were these hills in Florida hundreds of acres would be planted yearly. Besides we are practically exempt from the plague of mosquitoes that torment the lives of growers on the keys. Sheds are not used on the keys. The rainfall is about 60 inches. In Jamaica,

too, as on the hare rocky lands of the keys, limes and tomatoes could be extensively cultivated, both for England and America. Tens of thousands of barre's and crates are exported from the keys, and large sums of money are amassed there from,

In addition to the methods of cultivation applicable to Jamaica, to which I have referred, I have the pleasure to recommend the initiation of another system, which I anticipate will prove most successful. Bearing in mind the peculiar conditions of soil under which the plant is cultivated on a great scale, viz., in the sandy soil of Florida, and on the rocks of the keys, I have arrived at the conclusion that we have in Jamaica another peculiarly favourable condition of soil on which it can be cultivated with the greatest success. Between Old Harbour and the foot of the Manchester Hills, and in other localities, there are thousands of acres of comparatively level limestone rock, on which there is a thin layer of earth about 9 inches deep. Only small trees grow on this land. The soil is too shallow for other cultures. The rainfall is about the same as on the keys.

Sand or rocks in Florida effect the most perfect drainage conceivable. The other type of soil which I recommend,—a thin film of earth resting on a bed rock, it is impossible to surpass from the drainage point of view. Being fertile it is more valuable than sand. The air permeates freely. These conditious assured, abundant rain, rain that would prove prejudicial withou trock, will constantly invigorate the plants. Large areas are thus susceptible of cultivation based on the merits of the soil.—*Jamaica Board of Agriculture.*

(*To be Concluded.*)

CACAO CULTIVATION IN CEYLON.

MEMO. OF SUGGESTIONS BY THE P.A., SUB-COMMITTEE FOR EXPERIMENTS TO BE UNDERTAKEN FOR CIRCULATION TO THE CACAO COMMITTEE FOR REMARKS AND RETURN TO THE SECRETARY AS SOON AS POSSIBLE.

Name of Estate.

Acreage.

Elevation.

Monthly Rainfall (for as many years back as can conveniently be given).

No. of trees per acre.

Are the trees all of one variety, and if so, which ; or are they mixed hybrids?

Approximate age of trees.

Number of pods harvested each month.

Weight of dry Cacao harvested each month.

Weight of black Cacao (dry) harvested each month

Is there any shade other than wind helts, and if so, what trees do you use? (If certain areas are more or less closely planted kindly mention this)

Which in your opinion is best, and why?

Have you any Cacao trees with no or scarcely any shade? What is your opinion as to its vigour and yield?

Have you noticed any difference in the colour of the flowers—what coloured flowers in your opinion set most?

Which variety Foresters or Ceylon Red is in your opinion the heaviest cropper? Do you use manure? How often and in what quantity? What do you consider the best manure for Cacao, and what time do you think best for its application?

Have you noticed marked effects from the use of manure in gain in vigour or increase of yield in already vigorous Cacao?

Do you prune your trees, and if so, on what system, and have you noticed any benefit caused by it?

DISEASE. Is there any disease on stem, branches or pods in your Estate?

Have you adopted cutting diseased parts entirely out or shaving them, and if so, with what results?

What other treatment if any has been carried out in your Estate?

How often do you go round the whole Estate with curative work and how long does the round take?

What is the cost per acre of this curative work in the year?

What do you do with the empty pods?

Do you destroy diseased husks—by burning or otherwise?

What time of the year do you notice the effects of the disease most?

Is the disease worse in different parts of the estate—what are the environment and conditions in these areas as to aspect, dampness, shade and wind?

Whether the growing of suckers and gormandizers have been tried and whether they have enabled the trees to resist canker?

Whether artificial heating by steam has been tried in fermenting, or whether any artificial ferments have been used? With what effect?

The Committee will be greatly helped in their work of gaining knowledge of Cacao in relation to profitable cultivation if you will make experiments and carefully record notes of their results in the following matters:—

The growing of cuttings.

Suggestions.

Layering.

The elevation at which Cacao will grow vigorously

By planting a few trees on spots at different elevations and recording their prosperity.

By taking off any non-fruit producing branches and suckers and noticing if the total production of fruit increased.

PRUNING.

GRAFTING.

MANURING.

A. PHILIP,
Secretary.

GRAFTING EXPERIMENTS.—According to a recent number of *Le Jadin*, M. Lindemuth lately showed before the Prussian Horticultural Society some interesting specimens of grafting, in which the graft had exercised a more or less marked influence on the stock. The plants were:—1st, Yellow Wallflower on Red Cabbage, in which the plant had developed below lateral branches of Wallflower, with a shoot of cabbage and a head of Red Cabbage. 2ndly, Brussels Sprout on Yellow Wallflower. 3rd, Abutilon Thompsoni on Althæa narbonensis. The former is a shrub, the second is a herbaceous plant. Owing to the influence of the Abutilon the branches of the Althæa became persistent, and indeed, are two years old. 4th, Solanum erythrocarpum on Tomato (S. lycopersicum). The Tomato being the more rapid grower, communicated this property to S. erythrocarpum. 5th, Malvastrum capense became variegated by grafting with Abutilon Thompsoni. 6th, Hybrid Petunia on Nicotiana glauca. If Petunias are grafted on the stems of Nicotiana of rapid growth, fine shoots of Petunias on the stems can certainly be obtained. Mr. Winter, of Bordighera, has already made this experiment, and has grafted Petunias on many branches of Nicotiana glauca, which in that district grows as a shrub. The effect should have been very fine, but a storm bruised the heavy branches of the Petunias. 7th, A new plant, with variegated foliage, Sida Napæa, obtained by grafting with Abutilon Thompsoni, was a success in one instance, while another specimen remained green. 8th, Althæa rosea (Hollyhock) became variegated by the influence of the graft of Abutilon Thompsoni. Young seedlings of Althæa rosea, of Malvastrum capense, and variegated Anoda hastifolia have, so far, remained green.—*Gardeners' Chronicle.*

THE DATE TREE.

A writer 50 years ago stated that the date tree was the only tree whose cultivation was not neglected in Egypt. It might truthfully be said now that it is more neglected than any other tree. The cause is obviously due to the introduction of other staple foods, formerly unknown or rare, such as maize, beans, sugar cane, and many vegetables, especially the tomato and onion. Bread is now very cheap and the poorest beggar can buy it. European immigration has directly brought about the bettering of the lower and working classes and wages have gone up in many cases twenty-fold. The Berberee, especially, who formerly considered himself quite wealthy with the possession of a huudred date trees, now assesses their yearly profit at as many shillings, and finding the comparison between £5 per year and the wages and food received by his relations as cooks, bowabs, servants, etc., in Cairo, very unsatisfactory for himself, leaves his date trees to his wives and fathers-in-law and seeks work in the large towns. The characteristic national love of economy of effort has also greatly contributed to the neglect.

It is very interesting to read of the incidents which attended the introduction of many parent trees into this country. Rich and notable sheikhs made it a rule to bring back, if possible, on their return from the pilgrimage to Mecca, a young date tree taken from the base of some good tree en route. The usual chapter of accidents, as well as the ordinary mishaps, such as disease, plague, highway robbery, want of food and the death of the camel or the tree on the way, reduced the number of trees successfully introduced to a minimum. The species generally received either the name of the sheikh or the place of origin, It is probably owing to this custom that whilst there are only about 22 different varieties of date palms in Egypt the trees comprising them have about 250 different names. Of late the pride taken in their cultivation and the feelings almost of veneration for them have died away. The five commonest species grown in Egypt and the Soudan are probably; the Bedreshin, Cairo, Rasheet, Rasson Wadi, and the Fayoum date trees. The Bedreshin tree is very common, fruitful, and very high; its fruit is good and is ready about September. The Rasheet, largely grown in the Delta, is about half as high, has spreading leaves, and its fruit is large and lime-shaped and is not ready until the winter. The Cairo tree is also a smaller one and has smaller but sweeter fruit. The Rassan Wadi is said to have been brought from Arabia by a Moudir of Zagazig. It is like the Bedreshin date but has inferior fruit. The Fayoum is a smaller variety, has many spreading leaves, and its fruit is thin but very sweet. Some dates are only fit to dry, others to press, and others again to be eaten fresh. To cater for the native requirements is altogether unnecessary, for not only do these trees yield their supplies for local consumption but several hundred tons of inferior dates valued at about £7 per ton are imported yearly from Turkey. An adequate financial return for trouble and expense can easily be gained in Egypt by all cultivators who will extend and grow the better kinds of date. The Basha or Vanille date tree, the Sultani, and the Rasheet are excellent varieties and pay well. That superior fruit gives best returns can be seen by reference to the reports of the British Chamber of Commerce of Egypt, which give the annual average export of dates from Egypt for fifteen years as 645 tons, valued at about £18 per ton. For 1899 and 1900 the value was only £16 per ton, and yet the superior quality of Tunisian dates of the best kind imported was valued at nearly £32 per ton, "nearly double the price"?

From one or two important grocers in Cairo it has been learned that a Greek merchant has taken the trouble during the last two seasons to buy and neatly pack in 3-oke boxes some of the best and largest dates, which he has supplied to the grocers for sale at the retail price of 5 piastres per oke. Last year he only put on the market about half a ton, but all were very quickly sold. This year he has been able to procure about 4 tons and has already disposed of them all. This should be extremely encouraging to those who intend growing good trees. A few years ago England had only the boxes of pressed dates sold retail by street-hawkers on trucks at about 2 l. per lb and by grocers at perhaps a penny more. Immediately the import of dates in fancy half-pound and pound cardboard boxes from Algeria began, fruiterers, although at first over-cautious because of the price, found the sale quite easy and the demand increased enormously. Now, on account of their good appearance and superior flavour, they are becoming generally popular even with the middle classes. Much of this trade could be captured by cultivators in Egypt, for in no other country of the world is the climate so suitable for the date. Other products of the fruit and the tree might also be supplied, especially vinegar (similiar but superior to that made by the fellaheen), wine, preserve, brandy, and brooms.

There are many faults committed in the cultivation of the date palm in Egypt. Not only is water a necessity, but manure also, and so many of the trees which do not bear cannot do so simply because the roots have taken from the ground all available nourishment. The bases of the trees also are yearly left more exposed owing to the contact of the water. A good grower sets his young trees in a trench which is gradually filled up with fertilisers or good soil. The roots should never appear as they do almost everywhere in Egypt in old trees. Another serious fault, sometimes causing the same effect, is the want of sufficient root space. Cases could be mentioned where Arabs have taken the trouble to dig in the hard rock " with a pick-axe holes about three-quarters of a metre square, and set in these young young date-trees. On the premature death of these trees after an initiatory growth of promise they would probably sum up the cause by the ejaculation, " Wallah "—It is the will of God. Where the roots encounter resistance of the subsoil they will often push the tree out of the ground for several feet, and this is by no means an uncommon sight. Thinning fruit in its earliest stage is often very necessary. Natives generally allow it to fall but each fruit has robbed the tree of a certain amount of nourishment which might have been given to the remaining dates. Not many growers are willing to understand that 30 okes of large fine dates will bring in three times as much money as the same weight of small and ordinary ones. Yet many trees properly cared for can, and do, produced fruit as large as lemons or bananas if thinned in the same way as we thin grapes in our English vine-houses.

Young trees should be taken from the bases of the best varieties when 7 to 10 years old. They should be set in trenches about a metre wide where there is plenty of good surface soil. They should be put in the ground up to the leaves, which should be wrapped round with matting or straw. This favours the growth of the roots. Care should be taken to provide free exit for the new leaves at the stem. They should begin to bear fruit in three years and be in full bearing in 10 years. Trees grown from kernels are more healthy and vigorous and may live for 200 years. They are however a very long time growing to maturity and it is impossible to tell before flowering whether they are male or female. The young shoots at the stems, on the other hand, are always of the same sex as the parent. As the trees get old the lower parts of the trunks are inclined to become stony and the sap is unable to flow through them easily. It is well in such cases to apply a fertiliser in which nitrogen and phosphates predominate; the former to accelerate the movement of the sap, the second to promote the formation of new cells, and new tissues, and to facilitate flowering and fructi

fication. When the new tissues have gained a predominance over the petrified ones, the vital activity is strong, and the tree grows again under normal conditions. Manganese applied as a fertiliser exercises its oxidising action and procures the free circulation of the sap. The tree can also be beheaded but before doing this a hole must be made through the trunk about twelve feet from the summit and a cylinder of wood inserted so as to protrude on each side. Round this must then be fixed plenty of soil and manure which must be kept continually moist for about a year. The top part will then have sent out roots and can be planted just in the same way as a young tree. Should a date tree by any accident have its crown broken off or core damaged it may shoot out again if the top be covered with clay to keep in the sap. The process of grafting described some time ago by "Appella" in the correspondence columns of the *Egyptian Gazette*, does not seem to be known either in Egypt or the Soudan, though trees have been known to bear branches and shoots throughout the stem where they have been neglected. Some are to be seen at Ab Ain el Wadi in the Iddaila Oasis.—*Egyptian Gazette.*

THE VALUE OF CHEMICAL MANURES.

Under the auspices of the Bristol and a District Gardeners' Mutual Improvement Association, a most instructive lecture was given in St. John's Rooms on Thursday, January 9, by Mr. F. W. E. Shrivell, F.L.S. F.R.H.S., of Golden Green, Tonbridge. His subject was "Chemical Manures in the Kitchen and Fruit Garden," and was based upon the results of seven year's experimental work carried out in conjunction with Dr. Bernard Dyer, E I.C. F.L.S. F.C.S. H. Cary Batte Esq. President of the Association, presided over a good attendance, and was accompanied by Mrs. H. Cary Batten, who also takes a deep interest in the work of the society. The president, introducing the lecturer, alluded to the great importance of the subject to the district, where so much attention was devoted to agriculture and horticulture.

Mr. Shrivell, who illustrated his remarks by a series of diagrams, explained that for many years dung was the chief manure both for the farm and garden, but they were now trying, by means of a series of experiments at Tonbridge, to discover whether it was better to use large quantities of dung, or to use a smaller quantity with chemical manure, or to use chemicals entirely. With regard to the system upon which their experiments were conducted, the land on which each vegetable or fruit was grown was divided into sections, each being in area a fiftieth of an acre. One section was manured with heavy dressing of dung; a second with light dressings of dung; a third with chemicals only; and the other three with a light dressing of dung, an ordinary dressing of phosphatic manure (either basic slag or superphosphate of lime) and varying quantities of nitrate of soda. Diagrams were shown, proving that after seven years' experiments, the best result was obtained by employing a small quantity of dung with the use of chemical manure, this being specially noticeable in the case of Broccoli, Potatoes, &c. Nitrogen, phosphates and potash were the elements of farmyard manure. The value of dung was that it was such a marvellous mechanical agent. On light sandy oil, for instance, in dry weather it tended to keep moisture in the ground and prevented evaporation. In the clay soils it tended to lighten it and aerate it to a very considerable extent. That was the great advantage of farmyard manure or what was ordinary called dung. But it had a great disadvantage, and that was its cost. Speaking.

WITH REGARD TO FRUIT

the lecturer said experiments had been made by treating its culture in the same way as the vegetables were treated—heavy dressings of dung, light dressings of dung, plus chemicals, and chemicals alone. He had experimented on Gooseberries, Black Currants Red Currants, Raspberries, and Plums with light dressing of dung, plus chemicals, and with chemicals alone; and induced some interesting information upon, the effects on the different fruits. For the purpose of bush fruits—Currants, Raspberries, Gooseberries, &c., the quantities for 100 square yards (broadcast) should be 10 lb. superphosphate, 10 lb kainit, to be applied during autumn or winter, and in early spring 7 lb to 10 lb nitrate of soda. With regard to strawberries, experiments showed that they could not grow Strawberries entirely by the aid of chemicals, but that with a light dressing of dung added to chemicals, they would be much more satisfactory to the grower. Chemical manures were also useful for the purposes of growing Onions, Beet, and Celery. With regard to the latter, he knew that most gardeners were much in favour of sewage, when they could obtain it, but he strongly advised them never to use sewage, for there was a great objection to its use in growing any vegetable that was eaten raw. Sewage should never be used for anything that was not cooked. By its use in this respect, they were apt to spread such diseases as typhoid and diphtheria. In the use of chemical manure for Celery, they would have to use discretion, but they would find that a small quantity judiciously used would ensure a splendid crop. Then, again, they could make a good liquid manure for Cucumbers and Melons. One ounce of nitrate of soda in a gallon of water used once or twice a week would considerably assist them in growing these. Chrysanthemums again were the most difficult plants to deal with; a light liquid manure of half-ounce of nitrate to one gallon of water, might be used when the buds began to form, but they should stop to use it when the buds began to break. In the kitchen garden, chemicals for 100 square yards, with half a load of farmyard manure, should be used thus: Superphosphate, 14 lb. kainit, 10 lb. This should be dug in with the manure in autumn or early spring; and later on they should sow on the surface 10 lb of nitrate soda in two or more dressings.

After referring to the dressings for herbaceous borders (basic slag, 14 lb; kainit, 8 lb, pricked in in autumn; and nitrate of soda 8 lb, in March and April to the 100 square yards, Mr. Shrivell spoke on another subject which he said was important, and especially to the professional gardeners. This was

THE SUBJECT OF LAWNS.

He knew that many gardeners were troubled with Daisies and different weeds on lawns. He thought that wherever they had got a ground with a tremendous quantity of weed on it, that told the tale that the ground was really very poor. If he gave them something to make their lawns grow, they should not grumble at him if they had to cut the grass more often. There was a suggested dressing for a lawn of 100 square yards—14 lb of basic slag with 9 lb kainit, and a later dressing of 5 lb of nitrate of soda. This combination was a plant food to produce the finer Grasses and Clover, while it would do away with the Daisies and commoner weeds in a lawn. It did not follow that if they put this on one year that they need put it on the next. The basic slag and kainit had a tendency to stimulate the growth of Clovers: and if they did not want Clovers, they must keep these two away; but if they wanted a little Clover or Trefoil, put it on. That would do away with the Daisies. Whenever they saw a meadow full of Daisies and Buttercups they knew perfectly well that, as a rule, it was a poor meadow. They must use nitrate alone if they did not wish to grow Clover. His own feeling went to the balanced manure. It was very rarely that lawns had a dressing, the only thing they ever got was a little lawn manure, which was simply sand plus nitrogenous manure. The lecturer gave many other instances of the value of chemicals, and concluded his address amid applause.

(We must apologise to the Bristol gardeners for having held over this interesting and valuable reports,

Necessity has no law !—ED.)—*Journal of Horticulture Cottage Gardener.*

PINEAPPLES AND THEIR VARIETIES.

We have received the following letter from Mr. J. C. Harvey, of "Buena Ventura" Plantation, Isthmus of Tehuatenpec, San Juan, Evangalista, P.O. V.C. Mexico Dated 25th Nov., 1901, and which is worthy of publication :—

In the October issue of the "Tropical Agriculturist', I note an article signed J. B., copied from the Journal of your Society, *re* Pineapples, and although my principal interest here is Rubber and Cacao I take a special interest in all fruits, if only for home use, and have according to invoice of some two years ago some (2) varieties of pines—besides two sorts which I know nothing of. As a Britisher I hope I may be privileged to ask you a few questions, and also desire to submit a proposition. First, however, is there any difference between Smooth Cayenne and Kew Giant ? also, as between Golden Queen and Egyptian Queen ? Do you know anything of a pine called Black Antigua ? also Mauritius ? What is Ripley Queen as against Jamaica Ripley ? Is there such a pine as Trinidad ? To my mind, pine nomenclature seems very much mixed. What is Black Jamaica ? All these pines I have at least sent to me by a Florida specialist. Now as to my proposition. I have a pine here embracing in my opinion every good quality a pine should have, it was introduced four years ago direct from Guatemala—or lack of a name I call it "White Guatemala Spineless" —it is absolutely smooth and has much the appearance of Smooth Cayenne, that is to say, the plant. You doubtless are aware, that smooth Cayenne, has a very few short spines at the extremity of every leaf, and that the flesh is yellow, this plant has absolutely no spines whatever, and the flesh is almost snow white—sweet yet with a sprightly subacid, yet not stinging taste as some have—the fruit is technically smooth, not shouldered, nor yet conical—in fact, perfect in form—reaches with me with practically no cultivation 7 lb., if the suckers are taken at the right size ripens from end of January to June, and even July according to planting, core never woody—from the fact that I have had them in the house 10 days for perfect ripening should be a good marketer; it is a vigorous plant and makes plenty of slips or offsets—though not such a great number as Golden Queen does—anyway, a strong plant that can be calculated to give from 8 to 15 for propagation annually. I canot find any aocount of a pine in either Florida or the West Indies, agreeing with these characteristics, and I feel sure it would be a most valuable addition to your list of pines. I may say as regards soil that this pine seems to grow remarkably well in heavy soil, and in a much damper situation than many others I have, indeed some rot away completely at the roots under similar conditions, and have to be planted in selected situations—it also appears to do well in moderately dry places, though I think on the whole it is best adapted to moderately damp situations in rather heavy rich soil. Our rainfall here is 100 inches distributed over eight months, the bulk of the rainfall however occurs from May to October after which occasional rains till middle of February. March, April, and the most of May hot and dry.

Now what I desire to say is that I should like to get the following:—2 Rothschilds, 2 Ripley (red), 2 Ripley (green), 1 Sugar Loaf, 2 Bullhead, 2 Black, 2 Cowboy, 2 Cheeso, 2 Sam Clark, 2 Jerusalem—19 Slips for which I will send an equal number of offsets of the White Guatemala Spineless, they can be sent either way by mail—that is between Mexico and Jamaica.

I, of course, do not know whether you can attend to this yourself personally, if not, will you kindly communicate with somo grower that would care to do so, and advice at the earliest opportunity as I should greatly like to conclude the transaction before the dry seasons.

Are your publications for sale, if so, kindly advise cost of subscription.

We have replied as follows :—

We are in receipt of your letter of the 25th November, and have pleasure in replying to your queries as follows ;

1.—The Smooth Cayenne Pine Apple and Giant Kew are the same.

2.—The Golden Queen and Egyptian Queen are two of the Queen varieties, (the Ripley being a third.) They present similar characteristics but are not the same.

3.—The Black Antigua is the common pine shipped in quantities from Antigua.

4.—The Jamaica Ripley is the same as the Ripley Queen, the Ripley being one of the Queen varieties.

5.—We have never heard of any distinct variety called "Trinidad."

6.—It is indeed very desirable that pine nomenclaturo should be brought to some uniformity, now that in so many places pine culture is being put on a commercial basis.

7.—Black Jamaica is often called Black Spanish. It has dark green leaves, shading to a darker hue, almost a blue-purple in the centre, and the leaves are hollow—not open and flattish. The fruit is dark green, and is fit to eat before it shows any yellow or red. The leaves have little hooked prickles, not spines like the teeth of a saw, but set distinctly from each other.

8.—We do not know the White Guatemala Spineless, but all smooth-leaved varieties, so long as they are hard-fleshed and can carry well, are worth cultivating, because of the facility for working when close-planted. Your description of this variety almost fits our "Bull-head," but our variety, although sometimes having entirely smooth leaves, has generally some prickles set irregularly on the leaves; sometimes indeed the leaves are almost all prickly. The flesh of the Bull-head, when the pine is cultivated, is smooth, hard and white, with hardly any eyes, and has a sweet acid flavour much as you describe. The "Bull-head" also grows well in heavy soil, and though some Florida men have said it is the same as the Red Spanish, others have said it is not,—and we do not think it is.

9.—We will send you three or four of the varieties you name, but Bull-head and Cowboy are the same, and so are the Cheese and Sam Clark Pines. We shall attend to this personally, not knowing any one who will take the matter up in the spirit of an exchange. The subscription to our Agricultural "Journal" (copy sent herewith) is 4s. per annum, and one shilling extra to foreign subscribers.

We have here :—

Ripley—Red and Green.

Golden Queen (which might be called Yellow Ripley.)

Bull Head or Cowboy, (which is sometimes called Red Spanish, but is not.)

Sam Clark, Queen, Cheese, Goffe Pine, Red Pine ; which we have called 'Red Jamaica."

Sugar Loaf which you know.

Black Pine or Black Jamaica.

China Pines, very similar in general to the Black, but presenting some difference when examined closely in shape and colour of leaf, in placing of spines, and in colour of fruit. These characteristics of China Pines will be closely noted during the coming fruiting season.

Abbakas and Smooth Cayenne, imported from Florida and grown to a good extent here during these last few years.

Rothschilds and Envilles, only grown here to the most limited extent as specimens.

We have arranged to get the pine suckers asked for sent, and on receiving the "White Guatemala Spineless" suckers, will send them to the Public Gardens to be tried.—*The Journal of the Jamaica Agricultural Society.*

Wilson, Smithett & Co's Ceylon Tea Memoranda for 1901.

London, March, 1902.

A review of the course of the Ceylon tea market during the year 1901 is somewhat depressing, and is only relieved by the hope that the experience gained by the crisis, through which the industry has been passing, may prove of real and lasting benefit in the future. The evils caused by the over-production which resulted from the extensions indulged in, both in Ceylon and India, during the era of prosperity enjoyed by tea-growers a few years ago, were considerably aggravated during the past two years by the disorganization of the home trade in the early months of each year, occasioned by the anticipation by distributors of an increased Duty in the Budget proposals, resulting in a large volume of artificial business for the purpose of duty paying, and corresponding heavy capital expenditure, which reduced purchasing powers and affected trade in the country for a considerable time at a period of the year when the arrivals from Ceylon were heaviest.

The average Price of all Ceylon Tea sold on Garden Account in 1901 was 6.80d per lb., against 7.25d in 1900 and 8d in 1899.

During the year under review the ill-effects of the Duty scare were even more marked than in the preceding year. The full effect of the coarser plucking resorted to both in Ceylon and India, after the period of high prices in 1899, was not experienced until the early months of 1901, when the heavy arrivals of inferior to common tea were neglected in the rush to pay duty on previous and current purchases of more desirable qualities. At the commencement of the year the quotation for commonest Souchong stood at the very low figure of 4d per lb., and during the following two months it gradually declined to the hitherto unrecorded level of 3d per lb., whilst the coarsest qualities, of which unfortunately there was no small supply, sold at still lower rates. Had these ruinously low prices been confined to the abnormally coarse leaf, which was primarily responsible for the fall, there would have been slight occasion for regret, but the establishment of such low quotations had the effect of reducing the values of the necessary grades of useful Pekoe Souchongs and Pekoes to 4d and 4½d per lb., and several months elapsed before any distinct recovery set in, too late to save many gardens from incurring actual loss in the year's working.

The serious crisis with which planters were confronted and the obvious nature of its primary cause, ensured such steps being taken, without any collective action, as to modify to some extent the output of the season 1901-2. Manuring operations were to some extent restricted, coarse plucking was reduced, and, finally, Nature herself intervened with climatic conditions unfavourable to heavy flushing, and assisted in putting the industry again in a slightly more satisfactory statistical position, thus not only limiting the supply, but giving the bushes a much needed rest, which should be compensated for by improved body and flavour in the near future.

If, however, a system of rather finer plucking was adopted during the past year on those estates most responsible for the commonest leaf in the previous season, it does not seem as if that policy was universal, at all events on those estates which were remarkable for good tea during that peroid, and which then actually benefited by the inferiority of the bulk of the crop. The quality of the great majority of up-country teas was distinctly inferior in the autumn of 1901 to that of the previous year, and owing to the improvement in the classes below, the crack marks were considerably less prominent for quality, and consequently commanded less competition and realised lower prices. The district of Uda Pussellawa was most remarkable in this respect, the teas of this district being much less distinguished for their usual characteristic point and flavour; possibly the cause may be attributed to climatic exigencies unlikely to be repeated in the ensuing season, with which we are not acquainted.

The rest, to which the bushes have for some time past been involuntarily subjected, will, in the ordinary course of events, be probably followed by prolific flushing, and it seems advisable therefore that consideration should be given this year to the expediency of resorting to a system of plucking, more like that which used to obtain in the earlier days of the industry, when a maturer leaf was gathered, more especially in the case of those high-country estates to which we have been accustomed to look for a supply of fine Ceylon tea, but which have of late produced so much ordinary quality leaf. Although, owing to unfavourable climatic conditions, the actual output from Ceylon has, during the past few months, fallen considerably short of estimates, Stock of all Growths, visible and invisible, remains very large—some 30,000,000 lbs. in excess of that existing three years ago, when the important advance in the prico of common tea took place, and it seems reasonable to expect that by Midsummer, unless very unlikely circumstances should arise, an ample supply of common Ceylon will be assured, to provide for the requirements of

the dull summer season, followed by a plentiful supply of low-priced INDIAN leaf in the autumn. If this should prove to be correct it would seem to be to the advantage of the high elevations to check the desire for large yields, and to produce a more moderate quantity of really good tea as in earlier years, leaving the supply of "good common" tea—not unduly coarse leaf—to the low-country and medium elevations. It must have been apparent to the producers of a good deal of up-country tea during the past season that their manufacture did not compare satisfactorily with the most useful type of thick plain liquoring tea of the lower elevations, by reason of the character of their liquors which were so generally wanting in body and, insufficiently characterised by point and flavour, as well as on account of their lack of distinction in make and appearance.

HOME CONSUMPTION of CEYLON TEA during 1901 fell short of that of the previous year by 1,500,000 lbs. and declined in the year to 35.55 per cent. of the total, from 37 per cent. in 1900. This may be attributed, not to any decline in popularity of the leaf at home, but to the encouraging fact that the RE-EXPORTS showed a remarkable expansion. The total DELIVERIES, HOME CONSUMPTION and RE-EXPORTS together, exceeded the LANDINGS by 3,600,000 lbs. This inroad on the STOCK unfortunately did not prevent a decline in values owing to the excessive supply of INDIAN tea.

FOREIGN TRADE.—The steadily increasing hold that the CEYLON growth is obtaining in the extraneous markets of the world forms at least one subject for congratulation. The RE-EXPORTS from LONDON to the various Foreign markets during 1901 were 4,300,000 lbs. in excess of those of the previous year, notwithstanding the fact that the IMPORTS showed a falling-off of 9,200,000 lbs., and formed 41.70 per cent. of the EXPORTS of all growths, against 32.56 per cent. in 1900 and 6.30 per cent. ten years previously. A reference to the table we give of the DISTRIBUTION OF BRITISH IMPORTS OF CEYLON TEA will show that the increased demand for CEYLON tea has not come from one or two quarters only, but was practically universal.

The development in the direct trade from COLOMBO to the different tea-consuming countries of the world is also very encouraging. AMERICA and CANADA took rather less in this way than in 1900, but the fact that AUSTRALIA last year absorbed nearly 21,000,000 lbs. is a most satisfactory feature.

GREEN TEA.—This new feature in CEYLON manufacture has attracted a fair amount of attention. The demand for CEYLON GREEN TEA was not unnaturally somewhat spasmodic and quickly satisfied, but, on the whole, satisfactory prices were realised for the best samples. As was generally anticipated it was in AMERICA that this class of tea enjoyed the readiest market, and there seems to be little doubt that in time it will prove a formidable rival to the JAPANS and CHINAS, which have for so long held the field in the STATES and CANADA. At home, especially quite recently, the scarcity of CHINA Green Teas and their consequent important rise in values caused LONDON buyers to turn their attention to the CEYLON variety, it being thought that the fact that it blended less ostentatiously with Black Tea would make it acceptable. So far, however, this characteristic seems to have proved a bar to its finding favour with the old-fashioned consumers of Green Tea in this country who apparently prefer the unmistakable presence of the CHINA sorts in their blends. The demand for GREEN Tea in this country is, however, so unimportant that Planters will be well advised in confining their attention to the requirements of AMERICA and CANADA with regard to this description.

Our Summary of CEYLON tea sold at auction during 1901 comprises 600 marks. Owing to the endeavour to establish "unreported sales" last summer a good deal of tea was disposed of privately for a time, and it was frequently difficult to obtain authentic prices. We trust, however, that our statistics are not affected by this to any important extent and we can only hope that these Memoranda will prove as useful and correct as it is our constant endeavour to make them.

Estimated relative YIELD and AVERAGE PRICE realised for the different CEYLON Tea Districts, compiled from the Public Auctions held in LONDON between JANUARY 1st and DECEMBER 31st, 1901 :—

	1901. lbs. about	Av. Price per lb. about 1901.	1900. lbs. about	Av. Price per lb. about 1900.	1899. lbs. about	Av. Price per lb. about 1899.
NUWARA ELIYA, MATURATTA & UDA PUSSELAWA	4,550,000	8.35d	4,500,000	9.10d	4,000,000	9.25d
DIMBULA	19,825,000	8.25	18,250,000	8.75	17,000,000	9
DIKOYA	5,950,000	7.50	6,000,000	8	6,000,000	8.50
BOGAWANTALAWA	4,250,000	7.50	4,500,000	7.90	3,000,000	8.60
HAPUTALE	3,450,000	7	3,250,000	7.90	2,500,000	8.50
PUSSELAWA, KOTMALE, PUNDALOYA & RAMBODA	8,300,000	6.75	8,500,000	7	8,000,000	7.60
MASKELIYA	4,100,000	6.50	4,000,000	7.45	3,500,000	8.40
HEWAHETA	2,350,650	6.50	2,500,000	6.90	2,000,000	7.60
AMBEGAMUWA and LOWER DIKOYA ..	2,900,000	6.25	3,500,000	6.60	3,000,000	7.50
NILAMBE and HANTANE	3,350,000	6.25	4,000,000	6.50	3,500,000	7.50
KADUGANAWA, ALAGALA & KURNEGALLA	2,000,000	6.25	2,500,000	6.40	2,000,000	7.40
MATALE and HUNASGERIA	5,700,000	6.25	5,750,000	6.35	5,000,000	7.40
KNUCKLES, KELLEBOKKA & RANGALE ..	3,950,000	6.15	4,750,000	6.35	4,000,000	7.25
UVA	6,750,000	6	6,750,000	6.90	5,000,000	7.10
SABARAGAMUWA	1,550,000	6	1,750,000	6.55	2,000,000	7.50
KALUTARA, AMBLANGODA & UDAGAMA ..	3,250,000	5.90	3,000,000	6.25	3,000,000	7.40
DOLOSBAGE and YAKDESSA ..	4,700,000	5.75	6,000,000	6.20	5,500,000	7.25
KELANI VALLEY and KEGALLA ..	8,800,000	5.65	10,000,000	6.10	8,000,000	7

Untraceable marks and tea sold on "purchase account" to the extent of 6,600,000 lbs. are not included in the above estimate.

Summary of CEYLON TEA sold at public auction in London between January 1st and December 31st 1901. Estimated quantity in lbs. and average prices realised:—

Average Price for the Year was 6·80d per lb., against 7·25d in 1900, and 8d in 1899.

The initial letters following the estate names refer to the mean elevation, as follows:—

L (low) sea level up to 1,000 feet HM (high medium) 2,500 to 3,500 feet HH (highest) above 5,000 feet
M (medium) 1,000 to 2,500 feet H (high) 3,500 to 5,000 feet

		1901 About lbs.	Av. price per lb.	1900 About lbs.	Av. price per lb.
Over 1,000,000 lbs.					
Diyagama ...	H	1,247,000	9¼d	1,066,000	9⅞d
Over 500,000 lbs.					
Campden Hill ..	M	505,000	6⅛d	501,000	6½d
Culloden..........	L	505,500	6d	589,000	6¼d
Demodera..... ...	H	705,500	7d	605,000	7⅜d
Dunsinane........	H	564,000	8⅛d	431,000	9⅜d
Gonakelle	HM	508,000	6¾d	469,000	7½d
Hemingford	L	543,500	5⅜d	483,000	5⅞d
IMP	H	510,000	6½d	345,500	6⅞d
Kurugama...........	L	510,000	5½d	675,000	6¼d
Mattakelly.........	H	685,000	7⅜d	712,000	8¼d
Meddecombra.. ...	H	731,000	6¾d	756,000	7¼d
St. Leonards.....	HH	571,000	9⅛d	483,000	10¼d
Sunnycroft..........	L	598,000	5⅞d	585,000	6⅜d
350,000 lbs. to 500,000 lbs.					
Badulla	H	403,500	6⅞d	540,000	6⅜d
Cannavarella.........	H	386,000	8d	307,000	9d
Castlemilk	M	363,000	6⅜d	428,000	6⅜d
Craighead...........	M	493,000	6½d	400,500	7¼d
Degalessa....	L	433,500	5¾d	455,000	6⅜d
Elbedde	H	378,000	7⅞d	284,500	8¼d
Fordyce	H	395,500	7⅝d	387,500	7⅞d
Great Western	H	461,000	9d	370,000	9½d
Hauteville..........	H	415,000	8¾d	590,000	9½d
Holyrood East... .	H	357,000	8¾d	284,000	9¼d
K.A.W......... ...	HM	490,000	6d	421,000	6½d
Kirkoswald	H	450,600	7¼d	479,000	7¾d
Le Vallon..	HM	458,000	7⅜d	422,500	7¾d
New Peradeniya..	M	441,500	5½d	618,000	6¼d
Rangdodde	H	352.500	6¼d	375,500	6¾d
Spring Valley.......	H	381,500	7½d	429,000	7¼d
Talawakelle	H	467,000	10¼d	402,500	11⅛d
Tangakelly........	H	383,000	9¼d	404,500	9¼d
Tillicoultry	H	417,000	8d	430,500	9⅝d
Ukuwella............	M	350,000	5½d	355,500	5¾d
Vellai-oya......... ..	H	393,000	6⅝d	441,000	6¾d
Wanarajah	H	437,000	9d	383,000	9⅞d
Waverley............	H	400,000	9⅜d	401,500	10d
Wattegodde	H	406,600	8⅜d	405,500	8¼d
Walpola..............	L	388,000	5¾d	537,500	6d
200,000 to 350,000 lbs.					
Abbotsleigh.......	H	259,000	8d	251,000	8½d
Allacolla........ ..	HM	200,000	5⅞d	203,500	5⅞d
Allagalla	M	200,000	6½d	131,500	7¼d
Ambatenne	L	243,500	5½d	240,000	5⅞d
Antony Malle.......	M	291,500	6⅜d	239,500	6⅝d
Bambrakelly & Dell.	H	315,000	7½d		
Bandarapolla.....	HM	291,000	5⅞d	494,000	5¾d
Battagalla	M	205,500	5½d	221,500	6¼d
Beaumont	M	318,000	6¼d	241,500	6¼d
Belgravia.............	H	344,500	8d	432,000	8¾d
Binoya	HM	209,000	6¾d	184,000	6½d
Bogahawatte.........	H	221,500	7¼d	175,000	7½d
Bogawantalawa	H	327,000	7½d	313,000	7½d
Bogawana..	H	245,500	7¼d	251,000	7¾d
Brae	HM	239,500	6¼d	195,000	6¼d
Burnside Group...	M	261,500	5⅞d	307,000	6¼d
Bridwell......	H	235,000	7¼d	269,500	7⅝d

		1901 About lbs.	Av. price per lb.	1900 About lbs.	Av. price per lb.
Calsay................	H	200,000	7⅞d	175,000	8½d
Campion	H	369,500	8¾d	324,500	8½d
Chapelton	H	307,000	7½d	304,000	7⅞d
Concordia..... ..	HH	215,000	10¼d	230,000	11d
Clydesdale	H	304,500	8½d	259,500	8⅞d
Cocagalla.....	HM	253,000	7d	305,000	7⅞d
Cranley	H	289,000	8½d	252,000	9½d
Dartry	M	312,500	6½d	270,000	6¼d
Delmar	H	303,000	9⅛d	289,000	10d
Dessford.............	H	209,000	8½d	173,000	8⅜d
Digalla	L	214,000	5½d	202,000	6d
Duckwari.........	HM	312,000	6⅜d	346,500	6⅜d
Ederapolla	L	214,000	6⅝d	257,000	6d
Ellekande	L	231,000	5¾d	246,000	6d
Elkadua	HM	246,000	5½d	379,500	6d
El Teb	M	305,500	6½d	329,000	6¾d
Elston	L	296,000	8½d	575,000	6¾d
Ernan	L	267,000	5⅞d	310,500	6½d
Gallebodde	M	233,000	7¼d	251,000	8d
Gammadua........	H	253,000	5⅜d	316,000	5¾d
Gikiyanakanda	L	317,000	6⅜d	316,000	6⅜d
Glencairn............	H	214,000	6½d	197,500	7⅛d
Glenrhos	L	202,000	5½d	208,000	6d
Glenugie	H	249,000	8½d	224,500	8⅝d
Glenlyon	H	287,000	8¼d	202,000	9⅜d
Goorookoya	M	319,500	6¼d	342,500	6¼d
Gouravilla	H	352,000	7d	335,000	7½d
Gordon.............	HH	230,000	7⅜d	259,000	8⅜d
Glen Alpin	H	302,000	7d	315,000	6¾d
Gallamudina.......	M	358,000	6⅝d	367,000	7d
Halwatura	L	266,000	5¾d	235,500	5⅝d
Henfold..............	H	258,000	10¼d	260,500	11d
Hoonooeotua... ...	H	309,500	6¼d	289,000	6⅜d
Hope	H	318,500	6½d	317,500	7⅜d
Hopewell...........	M	268,500	5¾d	116,000	6¾d
Halgolla	L	313,000	5⅞d	141,500	6d
Hapupastenne......	H	308,500	5⅞d	47,000	6d
Ingestre	H	214,000	8¾d	188,500	10d
Invery	H	237,000	7⅞d	276,000	7½d
Imbollpittia.......	M	351,500	6⅜d	381,500	6½d
Kabaragalla	H	227,000	6d	167,000	6½d
Kadien Lena.......	M	274,100	6¼d	344,000	6¼d
Kandanewera . ..	HM	288,000	6¼d	271,000	6½d
Kehelwatte.......	M	267,000	6⅞d	229,000	7¼d
Kelburne............	H	226,500	7¼d	238,000	7⅞d
Kellie............	M	295,000	5¾d	368,500	6¼d
Kelliebedde	H	238,000	8½d	211,500	10⅜d
Knuckles Group.	HM	251,000	5¾d	303,500	6¼d
Kotiyagalla.......	H	338,000	8⅝d	343,500	8⅞d
Katooloya...........	H	2[illegible]2,000	6⅜d	229,000	6⅞d
Kottagodde...... ...	H	250,000	7d	204,000	6⅞d
Ledgerwatte	M	330,000	7d	300,000	7d
Labukelle	H	261,000	7¼d	263,500	7½d
Laxapana	H	277,500	7d	352,000	6⅞d
Lippakelle	H	240,000	9½d	250,000	10⅝d
Loolecondera	H	323,000	7⅛d	379,500	7¼d
Mahadowa.........	H	305,000	7¾d	348,000	8⅛d
Mahaoya	HM	276,000	5⅝d	290,000	5⅞d
Mariawatte..........	H	290,000	6½d	377,500	6⅜d
Melfort	M	252,000	7d	200,000	5⅞d
Meeriabedde.......	H	288,500	6d	256,000	6¾d

	1901 About lbs.	Av. price per lb.	1900 About lbs.	Av. price per lb.
Mayfield..........H	275,000	7⅛d	223,500	7½d
Mooloya ....H	328,000	7⅝d	387,500	7¾d
Morar................H	237,000	6⅜d	163,000	7d
Mossville .... M	277,000	7⅛d	304,000	6⅝d
Mount Vernon .... H	248,500	9⅜d	368,000	8¾d
Mudamana.........L	202,500	5⅜d	193,500	5⅞d
New Rasagalla..HM	254,000	6⅝d		
Nilambe.........HM	323,000	6¼d	365,500	6⅜d
Nayabedde.........H	223,500	8⅛d	200,000	9⅛d
Nayapane ....HM	218,000	5¾d	259,500	6⅛d
Needwood.........H	279,000	6d	339,000	6⅞d
New Peacock......H	306,000	7d	280,500	7⅛d
Nicholaoya ......HM	231,450	6⅛d	217,500.	7d
Norwood ....H	302,000	8¼d	346,500	7⅞d
Ouvahkellie .... H	214,000	8⅜d	209,000	9⅝d
Pambagama.......L	290,000	5d	264.500	5⅝d
Parragalla ....HM	262,000	6⅛	265,500	6⅝d
Penrith L	293,000	5¾	238,500	6⅛d
Pen-y-lan ....M	246,000	5⅝d	288,000	6⅛d
Peradeniya ....H	243,000	6⅜d	222,500	7d
Pitakande..........HM	245,500	5½d	594,000	5¾d
Portmore.............H	241,000	10½d	263,500	10⅜d
Poonagalla.........HM	303,000	6⅝d	397,000	6¾d
Pussetenne .... .M	251,000	6¼d	249,000	5⅞d
Queensberry......... H	242,500	8d	338,500	7⅜d
Ragalla ....H	304,000	9⅝d	384,500	9⅜d
Rangalla ....HM	255,000	7¼d	242,500	7½d
Rothschild .... H	342,000	6⅜d	364,000	6⅝d
Rutland ....H	298,000	6⅛d	282,500	6¾d
Sandringham ......H	314,500	7⅞d	340,000	9d
Sanquhar ....HM	263,500	6¼d	249,000	6⅝d
St. Clair..............H	289,000	8⅝d	289,500	8⅝d
St. John del Rey...H	309,000	8⅛d	311,500	8⅜d
Sheen ....H	216,000	9⅛d	211,000	9¾d
Sogama........... HM	265,500	6¼d	314,000	6⅝d
Stonycliff.............H	283,500	6⅞d	242,500	8d
Sorana L	279.300	5¾d	221,000	6d
Thornfield...........H	226,500	8⅝d	279,000	8½d
Udaradella.......HH	224,000	9d	211,500	9¼d
Ury.....................M	263,000	6⅝d	303,500	7d
Upper Haloya....M	207,000	5⅜d	186,500	6d
Verelapatna ....H	261,000	7⅜d	220,000	8¼d
Wangie Oya...... .H	202,000	7⅝d	171,000	6⅞d
Warriagalla.........M	254,000	5⅝d	250,500	6¼d
Wereagalla...........L	215,000	5⅝d	237,000	5⅛d
Windsor Forest....H	227,500	6⅜d	219,500	7d
Westhall ....HM	277,500	6¾d	355,000	6⅝d
Wavelkelly ....M	335,000	5¼d	269,000	6½d
Yataderia L	252,500	4½d	672,000	5¾d
Ythanside ....H	242,500	6¾d	216,000	7⅜d

100,000 to 200,000 lbs.

	1901 About lbs.	Av. price per lb.	1900 About lbs.	Av. price per lb.
Abbotsford ....HM	179,500	8¼d	196,000	8⅞d
Adam's Peak.......H	217,500	6⅝d	219,500	7⅜d
Agrakande...........H	114,000	7⅝d	148,000	7½d
Albion ....H	134,500	8d	128,000	9d
Aldie ....H	185,500	8⅝d	197,500	9⅜d
Alton ....H	177,000	8d	139,000	8½d
Alnwick .. ..H	128,500	8½d	113,000	8⅝d
Amherst..............H	173,000	9¼d	182,000	9⅝d
Ardross................L	139,000	5⅞d	137,000	6⅛d
Arslena ....HM	141,000	5⅜d	113,500	6d
Asgeria ....M	108,500	5⅞d	101,000	6¾d
Atgalla .... M	198,000	7¼d	248,500	6½d
Augusta Tea Estates Co............HM	116,500	6⅛d	146,000	6⅛d
Ayr...... L	208,500	5⅝d	243,500	6d
Abamalla............L	208,500	5¾d	205,500	6d
Appachy Totam....H	170,000	7⅝d	146,500	8⅜d
Lathford ....H	100,000	7¼d	85,000	7¾d

	1901 About lbs.	Av. price per lb.	1900 About lbs.	Av. price per lb.
Barnagalla ....M	164,500	6⅞d	205,500	7⅛d
Berat..................H	116,000	7½d	118,000	8¼d
Bellwood............HM	155,000	6¾d	130,000	7d
Berragalla ....H	142,500	7¾d	135, 00	8⅜d
Blackburn ....M	109,000	6⅛d	118,500	6d
Blair Athol..........H	154,500	5⅞d	200,000	6¼d
Brookside....H&HH	106,500	9¼d	117,000	10½d
Braemore .... H	208,000	8d	166,000	8½d
Bowlana............. M	103,000	5⅝d	107,000	6⅞d
Beddegama.. ....HM	135,500	6½d	149,000	6¼d
Bearwell . . ..H	200,000	8⅛d		
Cairn-mon-earn .HM	155,000	6d	94,500	6⅛d
Caledonia ....H	155,000	7⅞d	142,000	8⅝d
Carlabeck .... H	112,000	8¼d	123,500	8½d
Cattaratenne. ....HM	110,500	5¾d	120.500	5⅞d
Chrystlers Farm..H	182,000	7¼d	183,000	8¼d
Clontarf...............L	110,500	5¾d	121,000	6d
Cottaganga ....H	110,000	6¼d	172,000	6d
Dalleagles .... M	179,000	6d	185,500	6¼d
Dangkande ......,.HM	123,500	6¼d	95,500	6½d
Deeside ....H	155,000	7⅜d	176,000	7⅝d
Dehiowita ....M	126,000	5⅞d	152,500	6d
Delta..... ....H	168,500	6d	248,000	6½d
Deltotte .... HM	182,000	5⅝d	176,000	6⅜d
Denegama ....H	106,500	6d	133,500	5⅞d
Densworth L	170,000	4¾d	182,500	5½d
Derryclare ....H	145,500	7⅝d	125,500	8⅜d
Detenagalla ....H	101,000	8d	126,500	7¾d
Deviturai ....HM	138,500	7¼d	200,500	6⅝d
Dewalakanda...... L	167,500	5⅜d	276,500	5¾d
Dimbula ....H	190,000	8d	158,500	8¾d
Diyanillakelle ....H	129,000	10d	119,000	10⅜d
Donside.........HM	104,500	6¼d	95,500	6⅛d
Doteloya..............M	185,000	5⅛d	269,000	5¾d
Drayton ....H	161,500	9¼d	379,500	8½d
Dunedin L	188,000	5¾d	233,000	6⅛d
Ellawatte.........M	168,500	6½d	135,500	7⅛d
Edinburgh... ......H	129,500	7½d	106,000	8¼d
Eildon Hall.........H	195,000	8d	159,500	8¾d
Elfindale ....H	148,500	5½d	137,000	6d
Ellagalla ....M	131,500	5⅞d	95,000	6¾d
Eltofts ....H	169,000	7¾d	166,500	8⅛d
Emelina..........,..H	128,500	6⅞d	120,500	7¼d
Ellamalle.........HH	153,000	6½d	163,000	6⅛d
Farm...............M	145,000	6½d	166,000	6¾d
Fernlands.. ....H	101,500	9d	141.000	9¼d
Eetteresso........HH	159,000	6¾d	168,500	7½d
Ferham............ H	121,000	10d	89,500	9⅝d
Galkandewatte.....H	191,000	7⅞d	166,000	8⅜d
Gartmore ....H	150,500	7¾d	128,000	8¾d
Glenloch .... M	138,000	6¾d	140,500	6¾d
Goatfell............... H	100,000	1/0½	115,000	1/1⅛
Gonamotava .... .H	178,000	7⅝d	121,000	9¼d
Gorthie......... . .. H	170,000	7⅜d	166,500	7½d
Gonambil ....HM	157,000	6⅛d	179,500	6⅛d
Gowerakelle..........M	146,000	7½d	121,500	8d
Gona Adika Coy.. M	113,000	5⅞d	153.500	6d
Grotto ....M	114,000	6d		
Hantane ....M	163,000	5½d	209,000	5¾d
Happugahalande M	122,500	5¼d	180,500	5¾d
Hatale ....H	205,000	5½d	251,000	6d
Heatherley ....HM	114,000	5½d	268,000	6d
Hethersett...........H	111,000	9d	186,500	8¾d
Hindagalla .. ..M	146,000	7⅜d	147,000	7d
Holmwood...... ....H	120,000	10¼d	147,500	10½d
Holyrood West.....H	197,500	9¾d	177,000	9⅜d
Hunugalla.... ......H	106,500	5⅝d	71,500	6d
Hyndford . ... M	162,000	6⅛d	145,000	6⅞d
Hunasgeria.......HM	140.500	5⅝d	185,500	5¾d
Indurana..... L	125,500	6d	166,500	6⅜d

	1901 About lbs.	Av. price per lb.	1900 About lbs.	Av. price per lb.
Ingoya ....M	129,000	4⅞d	256,000	5⅝d
Kaipoogalla ....H	113,000	7¼d	98,500	7½d
Kaloogala ....M	107,500	6⅞d	119,500	7⅜d
Kalupahani .. ..H	114,500	7d	154,000	7½d
Kataboola............H	192,500	7⅛d	203,500	7d
Keenakelle L	157,000	6⅜d	217,500	6⅜d
Kelliewatte ....H	129,000	8d	133,500	7⅞d
Kelvin ....M	102,500	6½d	112,500	6¾d
Kintyre .... H	140,000	6¼d	115,000	7d
Kirrimittia ....M	187,000	6⅛d	183,500	7d
Kowlahena ....H	100,500	8½d	129,000	8⅜d
Kottagalla .. ..H	104,500	7⅜d	68,500	7⅞d
Kuda Oya............H	187,000	6¾d	193,000	6⅞d
Kew.................HH	155,000	7¼d	173,500	7½d
Knavesmire....... L	101,500	5¼d		
Lagalla ... .HM	117,000	5⅝d	136,000	5¾d
Lamiliere ....H	141,500	6¾d	96,500	7⅜d
Lavant L	161,000	5⅝d	258,000	5¾d
Lawrence .... H	193,000	6⅝d	222,000	7⅜d
Lindoola ....H	177,000	8¼d	205,000	8¾d
Luccombe ....HM	191,700	6¼d	238,000	6⅝d
Lynford .... H	129,500	8⅜d	145,000	8¼d
Leangawella.......HM	136,900	7⅞d	133,500	8d
Lonach ....HM	132,000	5⅞d	32,000	6d
Medenpennakande L	113,000	5⅝d		
Medampe .. ..HM	188,500	5⅜d		
Macduff .... .H	152,000	7¾d	128,500	8d
Maddagedera.........L	218,000	5⅜d	82,000	5⅝d
Mahagalla ....H	139,000	7d	142,000	7⅜d
Mahagastotte ....H	146,500	8⅝d	121,500	9⅜d
Mahaousa............M	197,500	5⅝d	221,000	5⅝d
Maratenne ....H	126,500	8d	128,500	7¼d
Meria Cotta.........H	182,000	8⅞d	170,000	9½d
Midlands ....HM	156,000	5⅜d	123,000	6⅜d
Minna ....H	175,000	7d	199,000	7⅜d
Mipitiakande.........L	203,250	5⅝d	184,500	6d
Mottingham ....H	106,500	6½d	95,000	7d
Moolgama ....M	117,000	6½d	115,500	6⅜d
Moralioya L	104,000	5¼d	98,500	5¾d
Mount Pleasant.HM	137,500	6¾d	133,000	6¾d
Memorakande ......H	163,500	6¼d	133,000	6⅜d
Meddakande ...... M	193,500	6¼d	97,500	6⅜d
Nikakotua L	170,000	5½d	257,500	6d
Napier... ....M	130,000	7⅛d	87,500	7½d
Narangalla ....H	102,500	4⅞d	125,000	6⅛d

100,000 to 200,000 lbs.

	1901 About lbs.	Av. price per lb.	1900 About lbs.	Av. price per lb.
New Forest ... . .. H	113,000	7⅛d	122,000	7⅜d
Newton ....H	133,100	7⅛d	155,500	7½d
North Matale ......M	169,000	6d	133,000	6½d
Nawalakande	138,000	7d	142,000	6⅞d
Oononagalla ......H	113,000	6d	155,500	7¼d
Opalgalla .. . ..HM	113,000	5⅞d	138,500	6½d
Orion ... . M	197,500	5⅜d	202,000	6⅜d
Osborne................H	191,000	7⅝d	141,500	8¾d
Pedro .... HH	126,000	8½d	123,500	9d
Pansalatenne ......M	129,000	5¾d	135,500	6½d
Pantiya................L	105,500	4⅞d	268,000	6d
Park ... .HH	125,000	9d	123,000	10⅝d
Pingarawe ......HM	184,000	7¼d	140,500	7¼d
Pita Ratmalie ......H	139,000	9⅜d	166,500	9d
Portree .. ..H	164,500	6⅜d	175,500	7⅛d
Portswood ... ..HH	176,000	8½d	94,500	9⅝d
Poyston ....H	119,500	6½d	130,500	7⅛d
Pundaloya ....H	180,000	8⅝d	173,000	9⅛d
Rugby ....M	198,500	6⅞d	156,500	7¼d
Radella ....H	115,500	7⅜d	110,500	6⅞d
Rappahannock ...H	120,000	7¾d	111,000	8⅝d
Ravenswood ......H	125,000	6⅛d	123,500	6⅞d
Relugas ....HM	177,000	5¾d	156,500	6½d
Riverside ....M	157,000	5⅜d	147,000	6d
Rickarton ....HM	150,000	6d	150,500	7⅜d
Ritnageria ....H	109,500	8¼d	83,000	9d
Rosita ....H	190,000	7¼d	288,000	7⅝d
Stinsford L	104,500	5⅜d	104,000	6¼d
St. Helens ....M	136,000	5½d	134,000	6⅛d
Shamrock ....M	162,000	5d	529,000	5⅝d
Sarnia ....M	131,000	7¼d	164,000	6⅞d
St. Andrew's (Mask).H	195,884	6½d	204,500	7⅛d
St. Clive ....M	150,000	4⅞d	254,000	5¾d
Silver Kandy ...HH	133,000	7½d	127,000	9⅛d
Somerset .. ..H	162,500	7⅝d	154,500	7⅝d
South Wana Rajah H	121,000	7⅛d	110,500	7½d
Springwood ....M	131,000	5⅜d	174,000	6d
Strathdon ......HM	183,000	6¼d	157,000	6⅞d
Stockholm ... .H	184,000	7⅛d	193,500	6¾d
Sutton .... H	108,500	11⅛d	78,500	11¾d
Sumtravalle ....H	145,000	8½d	133,500	9½d
Stisted L	101,500	6½d	45,500	6⅝d
Sapremalkande .. L	120,000	5⅛d		
Tallagalla L	204,200	6⅜d	216,000	6⅝d
Taurus .. ..H	156,000	8¼d	114,000	9½d
Theresia ... .H	135,000	8⅛d	144,000	8⅞d
Tillyrie ....H	126,500	7¼d	250,500	7½d
Troy L	131,000	5d	154,500	5⅞d
Troup ....H	146,500	8⅝d	136,500	9⅜d
Tyspany ....H	183,000	6¾d	190,500	7d
Tientsin ....H	142,000	7¾d	144,000	8d
Telbedde ....HM	105,000	6¾d		
Ugieside ....M	140,000	5½d	158,500	5¾d
Uva ....H	146,500	5⅞d	184,000	6¼d
Uvakellie ....H	145,000	8d	155,500	8⅜d
Vathalana ....HM	139,000	5¾d	106,500	6¼d
Valamaly .. ..H	136,500	7½d	119,500	8¾d
Venture.............. H	196,000	7d	195,000	7⅝d
Verelupitiya L	144,000	5⅝d	145,000	6⅛d
Waldemar............H	140,000	7⅝d	172,000	8¾d
Wallaha ....H	111,000	8⅛d	192,500	7¾d
Waltrim .. .. H	133,500	7⅞d	158,500	8⅛d
Wattakelly .... H	157,500	6⅝d	165,000	6⅝d
West Haputale .. M	110,500	6⅞d	89,000	8d
Wewelmadde ......M	113,500	6⅛d	141,500	6⅜d
Wewesse... ......HM	114,000	6½d	103,000	6⅞d
Wigton .. ..H	162,000	6⅜d	132,000	6¾d
Wihiragalla ....H	198,000	7⅛d	163,500	8⅜d
Wootton .... H	156,500	7⅞d	133,000	9⅛d
Walhandua	105,500	6d	77,000	6⅛d
Yahalakela L	115,100	5½d	287,000	6d
Yoxford...............H	155,800	8⅛d	129,000	9d
Yahalatenne......HM	110,000	6⅜d		

50,000 to 100,000 lbs.

	1901 About lbs.	Av. price per lb.	1900 About lbs.	Av. price per lb.
Aerawatte ....HM	54,500	7⅛d		
Abergeldie.........HM	72,500	6¼d	83,500	7d
Attabagie .... M	80,500	5⅞d		
Aigburth ....HM	88,500	5½d	107,000	6¼d
Ampittiakande .. H	89,500	6d	124,500	7¼d
Ambawella ....H	67,500	7⅛d	62,500	7d
Annfield .... H	99,500	8¼d	91,000	9d
Atherfield L	105,000	5⅝d	121,500	5⅞d
Athlone................M	81,000	5¼d	112,000	6d
Atherton .... M	55,000	5⅜d	20,500	6⅜d
Ambanpitiya L	55,000	5½d		
Batgodde ....H	75,000	7½d	82,000	8⅛d
Battalgalla ... .H	75,500	8¾d	210,500	8⅛d
Berrawella .... M	51,000	6⅝d	92,000	6⅝d
Benveula ....M	89,500	4¾d	211,000	5¾d
Beaconsfield ..... H	53,500	8¼d	85,000	8¾d
Beverley L	84,000	6d	85,500	7⅛d
Blackstone .... H	81,500	5½d	218,500	6⅛d

		1901 About lbs.	Av. price per lb.	1900 About lbs.	Av. price per lb.
Blackwood	H	94,500	6¾d	92,500	7¼d
Blair Avon	H	79,500	7d	83,000	7d
Bon Accord	H	75,000	7⅜d	78,500	7⅜d
Bramley	H	62,000	8⅛d	106,000	8⅜d
Broughton	H	93,000	6⅝d	88,500	8d
Ballacadua	HM	71,500	5¾d		
C'Galla	M	74,500	7⅜d	83,500	7½d
Chetnole	L	62,500	6d	37,000	6⅝d
Condegalla	H	102,000	7d	144,000	8⅝d
Coolbawn	M	86,500	6¼d	123,500	6⅜d
Craig	M	70,000	8⅝d	74,000	9⅝d
Cullen	L	74,000	6⅛d	149,500	6¼d
Dalukoya	H	58,000	6½d		
Deanstone	H	70,000	7⅛d	77,000	8d
Debatgama	M	91,000	4⅞d	209,000	6d
Dedugalla	M	52,000	4⅛d	138,000	5⅞d
Delpotonoya	H	66,000	6¼d	73,500	6¾d
Deyanella	HM	91,000	7½d	116,500	7d
Doombagastalawa	HM	88,000	6d	65,500	6⅛d
Devon	H	102,000	8⅝d		
Elangapitiya	M	79,500	4½d	213,500	5¾d
Excelsior	HH	80,500	9½d	141,000	10¾d
Ettie	L	57,500	4⅞d	58,500	5⅝d
Fairfield	H	65,000	8⅞d	96,500	8¼d
Faithlie	H	92,500	8¼d	185,500	7¾d
Fassifern	H	80,500	7⅜d	61,500	8¼d
Fruit Hill	H	99,500	6¾d	76,000	7⅜d
Forres	H	97,500	7¼d	123,000	7¼d
Galgawatte	M	94,500	6¼d	102,500	6¼d
Ganapolla	L	51,000	4¾d	100,000	5⅝d
Gavatenne	HM	73,500	7¾d	66,000	8¼d
Glenorchy	H	64,500	7½d	82,500	8¼d
Glentaaffe	H	94,000	7¾d	74,500	7¾d
Goomera	H	96,000	4⅝d	164,000	5¾d
Gallata	HM	70,500	6⅝d	96,000	6¼d
Gonavy	H	50,500	6½d		
Halloowellah	H	58,500	7⅛d	70,000	6¾d
Hatherleigh	M	70,500	4⅞d	107,000	5½d
Heatherton	HM	67,000	6d	81,500	6¾d
Holbrook	H	89,000	8½d	65,500	9d
Harmony	M	77,500	5⅝d	64,500	6d
Havilland	M	52,500	4¾d	212,500	6d
Harrington	H	83,500	7⅝d		
Ivies	L	97,000	5¼d	87,500	5¾d
Indian Walk	L	62,500	5d	46,000	5½d
Ingurugalla	M	99,000	5⅞d	65,500	6d
Igalkande	HM	64,000	5¾d		
Kallebokka	M	88,500	6⅞d	99,500	6½d
Kenilworth	HM	71,000	5⅛d	198,000	6¼d
Kalugama	H	67,000	7⅜d	44,000	8⅝d
Lauderdale	HM	94,500	5¾d	128,500	5¾d
Leangapella	H	99,000	5⅜d	108,000	6¼d
Loinorn	H	94,000	8⅜d	88,000	9½d
Lawrencewatte	M	67,500	4⅞d	96,500	6d
Logie	H	96,500	7¾d	76,000	7⅞d
Malvern	H	94,500	6¼d		
Mahacoodagalla	H	80,000	8⅜d	150,500	9½d
Marakona	M	54,500	6¼d	79,000	5⅝d
Marlborough	H	54,500	6½d		
Maymolly	H	70,000	7½d	80,500	7½d
Mincing Lane	H	83,000	7½d	80,000	7¼d
Mousakelle	H	50,000	6¾d		
Meddetenne	M	75,500	5¼d	86,000	6⅛d
Nahalma	L	70,000	4½d	178,500	5⅞d
North Cove	H	78,000	8d	89,500	9½d
Norton	HM	53,500	6½d	89,000	6⅝d
Nutbourne	H	80,000	9¾d	69,000	8½d
North Pundaloya	H	82,500	6⅝d	110,500	6¾d
Nahaveena	HM	51,500	5⅞d	61,000	6d
Oolapane	M	77,500	5⅞d	55,000	6⅜d
Orwell	M	72,000	5¾d	58,500	6d
Ormidale	H	84,500	9¼d	95,500	9⅞d
Pita Rajah	M	55,500	5⅞d	68,500	6⅛d
Panmure	H	81,500	6¾d	46,500	7⅜d
Peacock Hill	HM	84,000	6d	77,000	6¾d
Poengalla	M	64,000	6⅜d	145,500	6¼d
Rajawattee	M	57,000	5¾d	76,500	6⅜d
Rahanwatte	H	99,000	7¼d	79,500	7¾d
Rangweltenne	HM	66,000	5¼d		
Rillamulle	H	89,500	7¼d	110,500	7⅞d
Rookatenne	M	97,000	6⅝d	92,500	7⅞d
Sirisande	L	78,000	5½d	111,500	5¾d
Stonyhurst	HM	66,000	6⅜d	64,500	6⅞d
St Andrew's (Dimb)	H	57,000	8⅜d	64,000	8½d
St. Lees	H	65,500	7⅛d	66,000	7d
St. Margarets	H	63,500	8d	68,000	8⅜p
St. Vigean's	H	54,000	7⅞d	83,500	7½d
Sembawatte	HM	54,000	3⅞d	127,000	5⅜d
Scarborough	H	91,500	6¾d	117,000	7¾d
Shawlands	H	86,500	6⅛d	102,000	6½d
Shannon	HM	84,500	6⅜d	84,500	6¾d
Shrub's Hill	HM	97,500	6⅜d		
Tebuwana		65,000	5¾d	102,500	5¾d
Thotulagalla	H	95,500	10½d	99,000	9¼d
Torrington	H	69,000	6½d		
Tunisgalla	H	73,000	5d	116,000	5⅞d
Udabagie	L	64,500	5¼d	89,500	6d
Uma Oya	M	54,500	7⅝d	64,000	7⅜d
Viceartons	HM	50,500	5¼d	65,500	6¼d
West Fessifern	H	69,000	7¼d		
Wavena	HM	88,500	5⅝d	53,500	6¼d
Waharaka	L	61,000	5d	287,500	5¾d
Warriapolla	M	64,000	6d	71,000	6½d
Westward Ho	HH	71,000	8⅝d	48,000	7½d
Wattawella	M	71,000	6¾d	82,000	7½d
Wewebedde	H	54,500	6¾d	56,500	7½d
Wevekellie	M	83,000	6½d	62,000	7¼d
Weyweltalawe	M	90,500	6⅜d	155,000	6½d
Wellington	H	58,500	7⅛d	62,000	8⅜d
Weddemulla	H	98,500	7d	85,500	7d½
Weygalla	HM	58,000	6d	67,500	6⅛d
Weymouth	L	64,500	5¾d	87,500	6¼d
Yapame	H	97,500	6⅛d	75,000	6⅝d

20,000 to 50,000 lbs.

Avington	L	52,000	4¾d		
Allerton	M	48,000	4⅛d	103,500	5⅜d
Ankande	M	59,500	5¼d		
Anchainkatte	M	20,000	5⅜d	63,500	6⅜d
Avisawella	L	30,500	4⅜d	95,000	6⅜d
Avoca	H	28,500	7d	24,000	8¼d
Arnhall	H	24,000	5½d		
Aberdeen	HM	37,000	4½d		
Beauvais	H	34,000	6¾d	27,000	7⅜d
Bunyan & Ovoca	H	23,000	7½d		
Broadlands	L	26,500	5⅛d		
Bandara Eliya	H	43,000	7¼d		
Bluefields	H	44,000	5⅞d		
Bothwell	H	44,500	6⅝d		
Cholankande	M	28,500	8¼d		
Clunes	L	23,000	7½d		
Claverton	M	34,500	4⅝d	72,000	7⅛d
Coodagalla	M	21,000	4¾d	36,500	5¾d
Craigie Lea	H	26,500	6⅜d	25,000	7⅝d
Coreen	H	23,000	7d		
Damblagolla	HM	35,000	5¼d	73,500	6¼d
Dunnottar	H	27,000	6½d	61,500	6⅞d
Doragalla	HM	21,000	8¾d		
Deniyaya	M	23,500	5d		
Eastlands	H	38,000	6¾d	40,500	7¼d
Eila	L	29,000	4¾d	67,000	5½d

	1901 About lbs.	Av. price per lb.	1900 About lbs.	Av. price per lb.
Elemane ....H	47,000	6¼d	66,000	6⅝d
Erracht L	20,000	4¼d		
Eladuwa L	25,000	4⅜d		
Ella Oya ....HM	43,500	5½d		
Fairlawn .... H	34,000	5d		
Galkande ....HM	20,500	8½d		
Gantenne ....M	20,500	4⅞d		
Gallaheria ....H	42,500	5¾d	86,500	7d
Gangwarily ....M	39,500	4¾d	139,500	6⅛d
Glenalla L	25,500	5d	113,000	5¾d
Glendevon .... H	26,500	9¼d		
Glenanore............H	32,500	8½d		
Galphele ....M	20,500	5⅝d		
Glenesk L	49,000	5¾d		
Galatura ....H	33,000	7⅞d		
Hakurugalla..... ...L	27,000	7⅜d		
Hopton ....HM	41,000	5½d	108,000	6½d
Hornscy Estate Co. H	25,500	8¼d	27,500	10d
Hillside ....M	23,000	7¼d		
Inicawatte ....M	27,000	3⅞d	25,500	4⅜d
Iona .... H	44,500	9d		
Kallugalla.. ......HM	36,000	4⅞d	44,000	5¾d
Kahawatte .. ...HH	41,000	5¼d	38,000	7⅛d
Koladenia .. ..M	23,000	4⅜d	57,000	6d
Kurulngalla.........M	24,000	5⅜d		
Karandupona L	43,000	5⅝d		
Logan L	31,500	5¼d	152,500	5⅞d
Lauriston ....HH	35,000	7⅛d	55,000	8⅜d
Lovers' Leap .. HH	25,500	9d	62,000	9⅛d
Ladbroke ....HM	49,000	8⅛d	32,500	6¾d
Lochnagar ......HM	40,500	6⅜d		
Manickwatte ......H	20,500	6d	24,500	6⅜d
Mandara Newera H	34,000	6⅝d	51,000	7⅜d
Melton ....H	40.000	7⅜d	69,000	7⅜d
Midlothian ....H	33,950	7⅜d	73,500	7½d
Myragauga	46,000	4½d	71,500	6½d
Mousa Eliya ......H	24,000	6⅛d	87,500	6¼d
Mahakande ....H	22,500	7d		
Monte Christo ...M	36,000	5¾d		
Nakai Denia L	41,000	4⅞d		
Nella Oola	32,000	4⅞d	35,000	5⅞d
Ohiya .. ..H	41,450	6⅞d	45,000	7¼d
Old Haloya .... M	32,500	5¾d	40,500	5¾d
Oaklands L	41,500	5⅜d		
Oakwell ....H	21,500	6⅜d		
Pathregalla .. ..M	29,000	5d		
Pondappe ....HM	33,000	5½d	39,500	6d
Putupaula L	27,000	5¼d		
Poolbank ....H	37,000	7⅝d	68,500	7¾d
Rasagalla .... M	49,500	6¾d	136,000	6⅜d
Rassagalla ..... HM	33,000	5⅞d		
Rajawella L	43,000	5¾d	29,000	6d
Richlands.........HM	34,000	5¼d	23,500	6¼d
Robgill ... .H	37,500	7⅜d	76,500	8¼d
Sinnapittia .. ..M	30,500	6d	186,000	6⅜d
Stellenberg ....H	28,000	6½d	102,000	7¼d
Stubton ....M	42,000	4¼d	55,500	5⅞d
Savernake ......HM	36,500	5½d		
Summerville ..... H	49,000	5⅛d	87,500	7d
Syston ....HM	26,500	7⅛d		
Taprobana ... .H	47,500	5⅞d	77,500	6⅜d
Templestowe ...HM	37,000	6½d		
Udaveria ....H	48,500	6½d	50,000	7½d
Warleigh .... HM	34,000	7¼d	65,000	7⅜d
Warwick .... H	48,500	6⅜d	40,500	7½d
Woodend L	22,500	4⅝d		
Yuillefield ....H	47,500	7½d	91,000	7⅜d

5,800,000 lbs. comprising untraceable marks and tea sold on "purchase account" are not included in the above returns.

Weekly Public Auctions of Ceylon Tea during 1901 with average price realised:—

Week ending.	Number of Pkgs. offered in auction.	Av. price per lb.	Av. price per lb. for corresponding week 1900.	Week ending.	Number of Pkgs. offered in auction.	Av. price per lb.	Av. price per lb. for corresponding week 1900.	Week ending.	Number of Pkgs. offered in auction.	Av. price. per lb.	Av. price per lb. for corresponding week 1900.
Jan. 5	22,195	7·10	7·75	May 4	25,641	6·65	7·25	Aug. 31	25,976	7·00	6·85
,, 12	29,289	6·75	8·00	,, 11	19,508	6·55	7·25	Sept. 7	24,590	6·95	6·85
,, 19	30,314	6·60	7·75	,, 18	19,968	6·45	7·15	,, 14	22,966	7·15	6·85
,, 26	28,086	7·00	7·40	,, 25	24,761	6·60	7·00	,, 21	21,015	7·60	6·85
Feb. 2	39,703	6·50	7·25	June 1	no sales	—	6·75	,, 28	19,551	7·95	7·00
,, 9	28,979	6·30	7·50	,, 8	28,089	6·50	—	Oct. 5	19,207	8·00	7·20
,, 16	31,521	6·00	7·60	,, 15	32,045	6·45	6·75	,, 12	21,254	7·80	7·50
,, 23	21,081	6·30	7·75	,, 22	29,861	6·35	6·50	,, 19	16,735	7·80	7·70
March 2	30,376	6·50	7·60	,, 29	24,776	6·35	6·50	,, 26	19,660	8·05	7·55
,, 9	34,903	6·50	no sales	July 6	33,108	6·30	6·60	Nov. 2	16,926	8·20	7·60
,, 16	29,052	6·50	7·50	,, 13	16,189	6·45	6·90	,, 9	13,135	7·90	6·90
,, 23	25,578	6·70	7·60	,, 20	31,749	6·25	7·15	,, 16	18,409	7·65	7·40
,, 30	24,790	7·00	7·50	,, 27	29,687	6·50	7·80	,, 23	19,839	7·60	7·50
April 6	25,479	7·40	7·50	Aug. 3	29,809	6·50	7·30	,, 30	16,899	8·00	7·65
,, 13	no sales	—	7·50	,, 10	no sales	—	—	Dec. 7	29,710	7·55	7·55
,, 20	32,069	7·35	no sales	,, 17	30,614	6·70	7·10	,, 14	21,033	7·55	7·40
,, 27	33,329	6·90	7·50	,, 24	28,175	6·65	6·90	,, 21	20,032	7·55	7·15

Distribution of BRITISH IMPORTS of CEYLON Tea during the past three years, taken from the BOARD OF TRADE RETURNS.—

Year.	Home Consumption.	To Countries in Europe (chiefly Russia).	To U. S. of America.	To British N. America.	To Other Countries.
1901	90,825,519 lbs.	10,023,263 lbs.	2,504,299 lbs.	2,390,894 lbs.	3,154,250 lbs.
1900	92,470,009 ,,	8,487,963 ,,	987,509 ,,	2,131,367 ,,	2,168,585 ,,
1899	85,137,945 ,,	7,265,266 ,,	1,391,931 ,,	2,084,865 ,,	1,402,361 ,,

HOME CONSUMPTION of INDIAN and CEYLON Tea compared with that of CHINA and OTHER COUNTRIES last year, five years, and ten years previously taken from the BOARD OF TRADE RETURNS :—

	1901.	Percentage of total.	1896.	Percentage of total.	1891.	Percentage of total.
INDIAN ..	148,000,000 lbs.	57·81	123,000,000 lbs.	54·	99,000,000 lbs.	48·9
CEYLON ..	91,000,000 ,,	35·55	80,500,000 ,,	35·2	51,000,000 ,,	25·3
CHINA, &c. ..	17,000,000 ,,	6·64	24,500,000 ,,	10·8	52,500,000 ,,	25·8
Total ..	256,000,000 lbs.		228,000,000 lbs.		202,500,000 lbs.	

RE-EXPORTS of INDIAN and CEYLON Tea compared with that of CHINA and OTHER COUNTRIES last year, five years and ten years ago taken from the BOARD OF TRADE RETURNS :—

	1901.	Percentage of total.	1896.	Percentage of total.	1891.	Percentage of total.
INDIAN ..	13,226,367 lbs.	30·50	4,399,640 lbs.	13·	3,419,533 lbs.	10·15
CEYLON ..	18,072,706 ,,	41·70	8,496,663 ,,	25·	2,121,446 ,,	6·30
CHINA, &c. ..	12,089,772 ,,	27·80	21,131,503 ,,	62·	28,171,164 ,,	83·55
Total ..	43,388,845 lbs.		34,027,806 lbs.		33,712,143 lbs.	

FORESTS AND CLIMATE.

Tripoli was formerly a land of crops and woods. Now it is a desert containing ruins of the Punic and Roman periods. M. Mehier de Monthuisieulx, after traversing deserts of moving sand and awful stony roads, has visited Jebel Iffren, a mountain rich in traces of the Roman occupation, otherwise poor indeed —*not a tree, not a blade of grass.* The principal ruins are those of the ancient town of Sabratha, and those of Leptis Magna, the old Punic and Roman capital. These ruins show the former importance of the great emporium. The dead cities, formerly superb, are now humbled beneath the sands of the desert. During the Punic era the sands were not given to wandering, the earth was teeming with vegetable life. More in the interior may be found interesting remains of the old Roman towns on the plateau of Torouhna; these contain numerous constructions somewhat in the form of a portico, and with considerable certainty may be described as oil factories. The country was formerly covered with olive trees : Tripoli was one of the great granaries of the Roman Empire, an abundant source of corn, of oil, and of wine.

"To-day the whole region has become sterile, because of the disappearance of the great forests in the interior which held up the water and distributed it by the river-full." At present this former granary of Europe contains a miserable and scattered population living or starving, on a few lean patches of barley or alfalfa. M. Mehier thinks that the rest of Tripoli will soon be in the same state as Sabratha, Leptis, Oca, and the rest, for without forests water disappears, and without water man disappears.—*From an article by* ROGER DUCAMP, *Head of the Cochin-China Forest Department, in the* "Revue des Eaux et Forests."—*Indian Forester.*

PLANTING NOTES.

COLD STORAGE OF FRUIT.—Various experiments have been made in France as regards storing fruit, flowers, and vegetables, in ice chambers. M. Loiseau, President of the Montreuil Seine Societe d'Horticulture, showed at the autumn exhibition of the National Horticultural Society at Grand Palais some Peaches that had kept perfectly in a refrigerator built according to the plans of M. Douane, of Paris. The Peaches had been kept in the chamber fifty-three and fifty-eight days, and represented the varieties Mignonne, Bonouvrier, Belle Beauce, Imperiale, Alexis Lepere, and Galande. A wholesale dealer offered four francs each for them. The experiments will be continued.—*Gardeners' Chronicle.*

"RUBBER CULTIVATION IN WEST AFRICA."—This handbook is by Mr. J. H. Holland, Curator of the Botanic Gardens, Old Calabar, Southern Nigeria. It contains mention of six of the principal Rubbers of the world : Para, Ceara, African Vine, African Tree, Central American, and Assam, representing the three natural orders Euphorbiaceæ, Apocynaceæ, and Urticaceæ. Para rubber is not successful in West Africa; Ceara grows in some districts, but is a failure as a rubber producer, as also is Central American. Assam, after ten years' trial, does not yield so well as when growing naturally. Landolphias, from their climbing habit, are not well adapted for cultivation. The native tree (Funtumia elastica) possesses many qualties to recommend it. The rubber is of good quality. The book before us includes five large and useful plates.—*Gardeners' Chronicle.*

AMERICAN *VS.* ENGLISH MACHINERY IN CHINA.

Apropos of the frequent announcements going the rounds of the newspaper press, anent the capture of machinery orders by American firms in markets which the British manufacturer had previously dominated (certain identical reports being frequently repeated *ad nauseam* in the same journals in different forms), it is refreshing to get a glimpse of the other side of the question, and to find that one, at least, of the representatives of our chief staple industry requires not the admonition to "wake up." An old established firm of English Flour Mill Engineers have just secured the contract for the supply and erection of a large flour mill on the most modern system in North China. More than one firm of American makers were competing for the work, and, although they claimed to produce by their process better qualities and higher percentages of flour, the English firm in question was able to satisfy the buyers as to the superiority of their machinery, and its ability to produce qualities and percentages equal, or superior, to the Americans. This English house takes the contract at a price below any of the American houses, and has undertaken to ship the whole plant in ten weeks from date of acceptance of order. The firm in question is Messrs. E R & F Turner, Limited, of Ipswich, who, some months since, shipped a similar complete flour mill to China, the order for which was also secured in competition with America.

EXPORT OF JAPANESE TEA.

(To the Editor "*Home and Colonial Mail*,)"

Dear Sir,—The producers of tea in India and Ceylon are now endeavouring to copy the Japanese in their methods of manufacturing unfermented teas, and they may also take a lesson in another direction from the clever and capable people who have forced themselves so far to the front as to have become allies of Great Britain itself. Growers in Japan have ascertained that *quality*, not quantity, in production of tea is what pays, and it is a very significant fact that the exports have fallen from their maximum point in 1891 to the extent of 20 per cent reduction in 1900, but the valuation of the smaller quantity in the latter year was fully 30 per cent above that of the larger in the former year.

The moral is a plain one. If India and Ceylon can keep down their quantities, improve their qualities, and gain an increased 30 per cent on the selling values, the crisis in tea production will soon be a memory only.

Japan tea in the United States and Canada has fairly well held its own in consumption because of the very great attention and careful preparation given to the production for its principal foreign market, and all this in spite of the libellous and misleading advertisements regarding it formerly widely circulated in the interests of India and Ceylon tea. Those really did more harm to the latter than to Japan teas in disgusting the regular traders, who were trying to sell both, and they have done further harm in inducing the Japanese merchants to advertise very successfully the purity and merits of the tea they produce and sell. Indian and Ceylon teas, if of fair quality, well made, and sold at reasonable prices, should be their own best advertisements.—I am, sir, yours, &c.,

JOHN MCEWAN.

10 and 11, Lime Street, E.C., March 6th, 1902.

THE SETTLEMENT OF THE COCOS ISLANDS.

It would be hard to match for qualities of romance the story told in *Blackwood* by Mr Hugh Clifford of the settlement of the Cocos Islands. This real Viking Saga begins in the Orkneys in the first years of the nineteenth century. A chance whaling ship put in at one of the lesser islands in search of sailors, and two unwilling brothers were taken on board, their father seeing no other possible way of finding for them an opening in the world. The scene is then changed to Northern China, where the whaler is filling water-casks, and is there boarded and captured suddenly, and without disturbance, by a ship of war belonging to John Company. The reason of this piratical proceeding is then explained to the whaler,—the other ship's navigating officers had died of cholera, and substitutes had to be obtained from somewhere. Finally, the Orkney lad, George Ross, was handed over—he had a capacity for navigation—and the young Viking worked the ship without accident through perilous seas till they reached Calcutta. Warren Hastings heard the story, and gave the hero of it a naval commission. George Ross rose rapidly, and was associated with Raffles in Java, and shared his chief's misery at giving up the island to the Dutch. Had the officials in the Foreign Office in London troubled to break the seals of Raffles's despatches and read them, it is likely that no retrocession would have occurred. Through the years of his active life the Viking had longed once more to return to the island in the North from whence he came. Therefore he took a ship, whose building he had superintended, in discharge of his arrears of pay, manned her with Malays, and set sail for Thule. On the way thither he came upon a coral island, became in love with the place and brought there all his Northern kinsfolk, who together with Malays made the ancestors of the present inhabitants. The son of the first George Ross was a philosopher, and while he wrote a great work his people fell into idleness. He died, and his son, who still lives, and who had been educated in Scotland, succeeded him. He had all the energy and commanding genius of the founder of the family, and has succeeded in making his people industrious, prosperous, and happy. Though Muhammedans, they have abandoned polygamy; and though Asiatic, are neat and tidy. We have given the outline of this wonderful story only; the details are romantic, too, and Mr Clifford has told the story well.—*Spectator*, March 8.

NEW SELANGOR COMPANY.

The Kajang Coffee and Rubber Co., Limited, has been registered in London, with £23,000 capital, to acquire three estates in Selangor, namely: the West County Estate, managed hitherto by Allen & Co.; the Belmont Estate, and the Weld's Hill Estate. The business of the new Company will include growing and dealing in coffee, tea, india-rubber, and fruit, and prospecting for minerals. The first directors are Messrs. C W Prosser, A A Allen, E Field, and F H Hicks.—*Straits Times*, March 18.

MINOR PRODUCTS REPORT.

LONODN, March 6.

CAMPHOR (CRUDE).—It is stated that the Japanese Diet has passed the measure which will give that Government the control of the production of Camphor in Japan as is the case with the Formosan output. It is also reported that the market in Japan is rising, and that considerable purchases have been made

there, as the ultimate effect of this monopoly must be an advance in all markets. This announcement has, of course, led to an advance also on the London market, and sellers now ask 162s 6d per cwt, c i f, for crude Japanese for March-April shipment; but business is reported at slightly under this figure, and market here is quiet.—Camphor (Refined).—English refined is so far unchanged at 2s 1½d for ton lots of bells and flowers, but market is firm in view of advance in crude, and should the German refiners raise prices, the English will in all probability do so.

COCA LEAVES.—Green Truxillo leaves are quoted at 10½d per lb spot. In auction 8 bales of thin green Truxillo sold at 10d per lb.

OIL, CITRONELLA.—Small sales on the spot have been made at 10¾d per lb.

OIL, LEMONGRASS is quiet, at 7d to 7½d per oz. on the spot. A case of Hardouin's brand from Penang sold at 4d per oz., subject to approval.

CROTON SEED sold at lower prices, 25s 6d per cwt being paid for fairly bright seed, but about half mixed with dark.

KOLA.—For African quarters a bid of 1½d is to be submitted.—*Chemist and Druggist*, March 8.

MARKETS AT HOME.

LONDON, March 6.

ANNATTO SEED.—Offered, 42 packages. Sold, 0. Bought in at 2d.

ARECA NUTS.—Offered, 42 packages. Sold, 6. These were of good good quality, and realised 20s, being lower.

COCA LEAVES.—Offered, 36 packages. Sold 16. Fine Ceylon Huanoco character sold at 9d to 9½d and damaged at 3d, and broken green Truxillo at 10d.

KOLA NUTS.—Offered, 37 packages. Sold. 0. Bought in at 2½d to 6d according to quality.—*B; & C. Druggist*, March 7.

INDIAN PRODUCTS.

Major W Malleson has the following deliverance on this subject in Murray's "Review":—

Tho chief existing organic products of India other than food grains are ootton, jute, opium, tea, coffee, indigo and tobacco. The demand for Indian cotton must always remain somewhat limited on account of its short staple, and efforts to acclimatise other descriptions in India have not yet met with much success. The Indian cotton mills, especially those in Bombay, are at present greatly depressed, partly on account of the recent complications in China, partly because of low prices and competition. Moreover the cotton crop is largely grown in the districts which suffer most from famine, and a failure of the rains would affect it just as much as the crops of food grains. The further extension of cotton growing is therefore no remedy. Jute is growing in deltaic lands, and is consequently practically unaffected by the vagaries of the monsoon. The industry, however, is probably as well looked after as any in India, and needs no special encouragement. Opium is a Government monopoly and need not be further considered. The tea industry has suffered considerably of late years from over-production, the demand not having kept pace with the supply, chiefly on account of the neglect to open up new markets. But efforts are now being made to introduce the tea-drinking habit amongst the natives of India, and energetic measures for pushing the sale of Indian tea in countries such as Persia and the United States are already showing signs of promise. Coffee is a comparatively small and uncertain crop, only grown in the hills of southern India, and offering no solution to the problem before us. Indigo has been much depressed of late, owing to low prices and the competition of the synthetic substance made in Germany. There is every hope, however, that improved methods of cultivation and production will once more place the indigo industry on a satisfactory basis. Tobacco is largely grown throughout India to meet native requirements. It is only in southern India and in parts of Tirhoot that any effort is made to cater for Anglo-Indian and European tastes. The time-honoured "Trichy," so beloved of the Anglo-Indian of a dead and gone generation, is now seldom seen. Since the manufacture at Dindigul and other southern centres has been largely taken up by English firms there has been a very great improvement in the quality of the out-turn. Indian cigars and cheroots are now held in wide esteem, considerable quantities being sold in England and elsewhere. But there is ample room for further improvements, and only capital is needed to make India a very formidable rival to the chief tobacco-growing countries of the world. The soil and climate of certain selected parts of India are admirably adapted for the growing of the best description of tobacco, and there is little doubt that if the cultivation of the varieties at present grown in Cuba, America and Turkey was seriously undertaken the result would be more successful. Within quite recent years the native of India has taken largely to cigarette smoking. Most of these cigarettes are of American origin, but there is no good reason why India should not supply her own requirements in this respect.

RUBBER OUTPUT OF THE AMAZON VALLEY.

Writing from Para at the end of December, the U. S. Consul says about 700 tons more rubber than had ever before been shipped from the upper tributaries of the Amazon in one season was then on the way down the river, and at least 200 tons more was expected to follow. After reviewing the situation in the markets, he concludes that there is every reason to believe that this season's rubber crop will exceed that of the previous year by a very considerable margin.—*Sell's Commercial Intelligencer.*

INCREASE THE ATTRACTION OF SHOWS.

It is recognised by many, says the *Live Stock Journal*, that larger attendances of the general public are desirable at agricultural shows in order to meet the increased expenditure which the growth of these exhibitions has necessitated. There is a feeling also that the former attractions are not now sufficient to draw all the visitors, not directly associated with agriculture who used to attend the meetings, because competition has become keener, and other bodies who cater for the public have displayed greater enterprise in providing what is wanted. The agricultural shows are to a certain extent the modern substitutes for the ancient fairs, which have been in many places also superseded by auction marts. The old fairs had several days which were devoted to business, and one was given up to pleasure. This latter element, it is thought, has not received sufficient attention from the managers of all our shows.

The object of an agricultural show is the thoroughly practical one of improving the live stock and agriculture of the country. It would be a regrettable circumstance if this fact were ever to be overlooked in the slightest degree. Consequently, no one would suggest any curtailment or modification of the existing full classes for all varieties of breeding stock. Addition rather than supersession ought to be the policy in increasing the attractions of shows to the public.

The horse department is that which is most likely to provide attractions for the gate-money public. The sections for breeding animals should be maintained as at present, or extended where desirable, and if the example of the Shire Horse Society in giving prizes

to breeders were followed, it would add to the interests of farmers. The group classes also give a new and useful feature.

Prominent amongst the recognised attractions of many shows are the jumping competitions, which with their regulation single hurdle, gate, double hurdle, wall and water have become well-known institutions. The greatest credit is due to the originator of the bending competitions for polo ponies which have deservedly become popular since they were first instituted. Occasionally, too, public interest is stimulated by a driving competition, but for this a large area of ground is required to do it well, such as the big ring of the R A S E. It goes without further saying that in sport-loving England such competitions ought to be keenly contested.

Among other suggestions a correspondent says that bare-backed riding competitions would be likely attractions, even though they might be characterised by some critics as circus performances, though why a man's ability as a bare-backed rider should be derided whilst his seat in the saddle is applauded, no one who has witnessed the ride of the cavalry-men from the Canterbury Depot at the Military Tournament is likely to understand. Pursuit races, embodying mounting and dismounting, saddling and unsaddling tests, should surely be the means of assisting "gates": and, should it be desired to combine instruction with entertainment, an exhibition of breaking unmanageable horses might be appreciated by a good number of visitors whose duties bring them into collision with evil-tempered beasts. Then the parades of cart horses in gear might be increased and enlist the interest of the users of horses in towns and lead to further emulation amongst them, with the result that they desire to possess superior teams.—*Agricultural Journal and Mining Record.*

PRODUCE AND PLANTING.

The usual monthly statistics of the values of the representative group of Indian and Ceylon

TEA PLANTING COMPANIES'

shares, compiled by Mr. George Seton, of the Indian Tea Share Exchange, 120, Bishopsgate Street Within, E. C., show that the market value of forty-five companies (thirty-six Indian and nine Ceylon) remained almost exactly as it stood a month previously. In a few cases there was a slight fall, but this was rather more than counter-balanced by a corresponding slight rise in others :—

Face value of forty-five companies	..	£9.500,000
Market value July 1, 1897 highest	..	£12,000.000
,, January 1, 1901 ..	..	8,550,000
,, July 1, 1901 ..	..	7,000,000
,, January 1. 1902 ..	..	6,990,000
,, February 1, 1902 ..	..	6,880,000
,, March 1, 1902 ..	..	6,890,000

The grand total of the share and debenture capital of 152 companies (86 Indian and 68 Ceylon) of which particulars are obtainable amounts to nearly £18,000,000 so that, on the basis of the above figures, it is estimated that the fluctuation in value for the whole has been approximately as follows :—Face value of capital of 152 companies £18,000,000 ; market value as at July 1, 1897, £22,750,000; market value as at March 1, 1902, £13,000,000 : or a depreciation of nearly 43 per cent. in less than five years' time.

There is no doubt that the work done on behalf of Indian and Ceylon tea in connection with

EXHIBITIONS

is most effective. The Paris correspondent of the *Pall Mall Gazette*, bears testimony to this in referring to the development of tea drinking in France. He says :—" One of the most striking of recent innovations in Paris is the number of tea-rooms that have sprung up. They nearly all date from the Exhibition, where there was much selling and drinking of tea, principally Ceylon teas. Most of the tea now drunk in Paris comes from the British Crown Colony, and should therefore be a subject of gratification to English people. While, of course, the five o'clock tea in the home circle is not new, this foregathering in restaurants for the consumption of tea and toast is quite a recent development. A fashionable rendezvous is a large hotel in the Champs Elysées, where the Parisian comes of an afternoon with his women-folk to drink tea and listen to the strains of an excellent band. Most of the great hotels have an institution of the kind, and certain of the most popular tea-houses have a passable orchestra. Music, possibly, is regarded as a sort of compensation for poor toast and muffins ; that is one of the secrets that the French have not learned.......The vocabulary of the tea-house, like that of football and ping-pong, is English. One easily slides into 'tea and toast'; it is a good working formula, and, if you draw near, you may hear Monsieur trying a little English on his female friends who seem to stand it remarkably well or casting a semi-critical eye over the *New York Herald*. The tea hour will not displace the hour of the apéritiff because that comes at the end of the working day, but the new-found devotion of the leisured classes to tea drinking is a most notable social change.

The New York journal, "Tea, Coffee and Sugar," is optimistic about the prospects of

TEA PRODUCTION

in the Southern States of America. It says: "The tea producers and shippers in China and Japan are watching with interest the experiments of Dr Shepard at Summerville in the growing of tea and the development of the commercial possibilities of the industry as shown by the establishment of the gardens of the American Tea Growing Company near Charleston. The Agricultural Department of the United States has an agent in the Orient, studying conditions in that section of the world, and in a report he has made to Secretary Wilson he calls attention to this matter of the tea growing industry of the United States and the interest taken in it in the Far East. The Chinese and Japanese growers express the opinion that the undertaking will not be successful because of the difficulty of securing cheap labour, but this problem has been practically solved by Dr. Shepard, as perhaps they do not know. If they were more familiar with the conditions that have been developed here as to the possibilities of tea production, they would probably understand that their monopoly of this trade cannot longer be maintained in the American market." China and Japan tea growers may be watchful, but we doubt if they are anxious. If so, they are easily alarmed. As Indian and Ceylon growers are not mentioned in this connection, perhaps they do not count. Anyway, they are accepting the situation philosophically at present.

The March circular of the British Chamber of Commerce, Paris, has the following with reference to the protracted question as to the French duties on colonial produce: "The Bill to which we referred in our monthly circulars for January and February has now been voted by the Senate and promulgated as a law under date of February 22, 1902. In this connection decrees have been issued to the following effect :—The duties provided for by the minimum tariff will continue to be applied provisionally to colonial produce mentioned in article 1 of the laws of February 24, 1900, and July 17, 1900, coming from China, Corea, Ethiopia, Siam, the Republic of Liberia, Muscat, Straits Settlements, Malay Federated States and Hong Kong. The duties provided for by the minimum tariff will continue to be applied during six months from February 24, 1902, to colonial produce mentioned in article 1 of the laws of February 24, 1900, and July 17, 1900, coming from the United States of America, Porto Rico, Peru, Guatemala, Nicaragua, Honduras, British India, Ceylon, Mauritius, the Seychelles Islands, Jamaica, Dutch Indies, German possessions in Africa, Spanish possessions of Fernando Po, Annobon, Corisco, Elobey, and on the west coast of Africa."

Mr H C Richards, M.P., writing from Darjeeling, February 6, says: "I was in Calcutta when the telegram came out recording the production of the Giffen suggestion to still further tax tea, whilst leaving untouched the hundreds and thousands of foreign products 'made in Germany' and manufactured in France or the United States. I was asked by some of the representatives of the great tea industry in British India if I would help to lay their protest, accompanied by statistics, before the Chancellor of the Exchequer, and this I did by the second January mail, since which time I am glad to say that His Excellency the Viceroy has telegraphed his support of the prayer of the Chambers of Commerce. I have by last week's mail sent to Downing Street the accompanying statistics, which prove most conclusively that each penny increasing duty renders the work of the British tea-grower in India less remunerative; and I trust that my many grocer supporters will recognise that in my visit to Darjeeling I am seeking on the spot the necessary statistics to oppose this latest suggestion to further tax them. Average rate of dividends on the sixty tea-growing companies which appear in the Calcutta share lists: 1898, 3·75 per cent; 1899, 4·70 per cent; 1900, 2·42 per cent., representing a capital of R20,169,300, equal to £1,344,620. Average rate of dividends on sixty-two Indian tea-growing companies registered in London: 1898, 4·04 per cent; 1899, 5 per cent; 1900, 3 per cent., representing a capital of £5,422,829. Again: Exports from India and Ceylon during 1900, 334,000,000lb; world's consumption during 1900. 314,000 000lb; surplus, 20,000,000 lb; add excess of production over consumption at end of 1899. 14,000,000 lb; total, 34.000,000. During 1900, consumption exceeded production by 9,000,000 lb owing to the opening up of new markets, but there still remains a surplus in London of something like 23,000,000 lb. The above figures show clearly that any curtailment of consumption, such as would result from an increased duty would be fatal to the industry and would not only involve the loss of capital, but would throw out of employment thousands of natives of India."

Mr Henry Cooke, of Moscow, the British Commercial Agent in

RUSSIA,

is doing his best to promote trade between the two countries. He addressed a meeting at the Manchester Chamber of Commerce on Monday, at which he set forth the obstacles and encouragements to British trade with Russia, a partially developed country presenting to us, he said, in some senses, greater possibilities than more fully developed regions. When in London Mr Cooke, as was mentioned in our issue of February 14, was approached on the subject of the probability of the Russian Government reducing the high duty levied on tea from India and Ceylon, and he urged that some efforts should be made by those interested to secure representation on the subject. In Manchester Mr Cooke referred to the tariff difficulty as regards general trade, but in view of the desire frequently expressed recently in Russian circles for a further and fuller development of trade between Russia and Great Britain, he thinks that some attempt should be made here to remove obstacles. He said that Russia was in some respects more like a vast colony that wanted opening out. It was mainly owing to foreign capital, foreign machinery, and foreign skilled workmen that Russia had been to some extent opened out. Officially foreign capital and industry were welcomed in Russia, although to a fuller development of her own industries many obstacles were placed in the path of foreigners. Apropos of Russian trade, we notice that Mr George Collins Levey, the British Commissioner for the British Exhibition in St. Petersburg, has made a long statement in reply to the criticisms of the Lord Mayor of London and other gentlemen who have withdrawn their support from the exhibition. In this he says: In reference to the recent withdrawal by the Lord Mayor of London and Lord Avebury, from their positions as members of the British Advisory Committee for the St Petersburg Exhibition, I have to state that the Russian Administrative Committee would have felt the action of their lordships very strongly if they did not feel convinced that it was taken on erroneous information forwarded by British subjects resident in St Petersburg, whose trade interests, either as manufacturers or merchants, make it quite natural for them to be unfavourably disposed towards the exhibition.—*H. and C. Mail*, March 14.

THE WORLD'S FAIR IN ST. LOUIS.

The International Exposition to be held in St. Louis, Missouri, next year, will, as is common with Americans, recognize a sentiment. Having in 1876 commemorated Independence, and in 1893 the discovery of America, they now choose the centenary of the purchase of Louisiana as the occasion for their third World's Fair. As this was, perhaps, the largest peaceful transfer of productive lands known to history, it commends itself from a practical as well as from a sentimental point of view. Its political effects are scarcely less in evidence than those of a material character. But the latter challenges attention by the fact that the 12 States and two territories carved out of the purchase now have a population of more than 15 millions, and that they have become a granary for the world, and also supply much of its minerals, so that its property and annual products exceed those of many of the old kingdoms which have played a great part in the world. The price paid for this tract, just exceeding a million square miles, was the equivalent of £3,000,000.

Preparations have been made upon a scale hitherto unknown. Congress has recognized it as a matter of interest to the whole country, and not merely to that portion included in the original transfer. The Federal Government has contributed $5,000,000, or one-third of the capital sum deemed necesary. St. Louis, as the largest city was chosen as the place, and the duty of providing the remainder of the funds has been accepted by her people. A second $5,000,000 has been raised by an issue of municipal bonds, while the third $5,000,000 was subscribed to a company upon which is laid the responsibility, under rigid laws and regulations, of organising and carrying on the Louisiana Purchase Exposition. This body includes 93 of the leading professional and business men. At their head, as president, is ex-Governor David R Francis, who was Secretary of the Interior in the Cabinet of President Cleveland.

The chosen site appropriates about one-half of the 1,300 acres which make Forest-park, with enough adjoining land to cover about 1,000 acres. Fortunately it was possible to make arrangements by which the grounds of Washington University, with its 110 acres and new building, to the value of more than a million dollars, were acquired temporarily for the use of the fair. These grounds are within the boundaries of the city, closely related with one of the most comprehensive systems of internal traction known even in America. Some railways already run through these, and all others

will be connected. The fair will thus be within easy reach at small cost, whether in money or exertion.

The plan and scope adopted contemplate "the presentation of manufacturing industries in actual conduct as well as of the machinery out of action; the exhibition of processes as well as of completed products." As many novel features as possible will be shown, but nothing will be sacrificed to them. As it has larger capital resources than any previous exhibition, its managers have procured the best and most experienced men available, and are themselves working with much spirit. In addition to the amount already mentioned it is estimated that the various States will appropriate sums ranging from $50,000 to $1,000,000 each, so that these sums will aggregate about two-thirds of the capital sum. Foreign Governments, which spent about $6,000,000 at Chicago, are expected to do as well at St. Louis. It is estimated that the public money drawn from all sources, together with that raised by the St. Louis subscribers, will reach about $30,000,000.

Work is going forward as rapidly as is possible in the formative period of an undertaking of such magnitude. Buildings and sewage systems are under contract, lakes and other landscape features are in course of construction, and branch railways are surveyed. Invitations have been extended to all foreign countries, and many of them—about 12 or 15, including France and Japan—have been accepted. Diplomatists are in negotiation with Governments, representatives are busy over new schemes, and exhibit agents are devising plans in every part of the world. Among novel features a balloon tournament has been provided for, upon which it is proposed to spend $200,000 in expenses and prizes. Congresses, drawing their delegates from all over the world, are being arranged, and patriotic, religious and social bodies are preparing to hold conventions or to make exhibits. Energy and bustle, with a desire to rival or excel all previous efforts in this line, are everywhere evident.

As a part of the work, and from a desire to interest visitors and exhibitors from the United Kingdom, offices have been opened at Sanctuary-house, Tothill street, Westminster, S.W. The representative is Mr. George F Parker, formerly United States Consul in Birmingham.—London *Times*, March 13.

PHILIPPINES: THE FAVOURED LAND.

Luzon, on which Manila is located, contains an area of 47,238 square miles, which is nearly 2,000 square miles larger than Pennsylvania and 3,000 square miles larger than Ohio. It possesses millions of acres of land awaiting the coming of the American husbandman. Its minerals comprise coal, gold, lead, copper, iron, sulphur, marble and kaolin.

The area of the Island of Mindanao is 36,237 square miles. This island alone possesses enough wealth when utilized to make it a world power. On the gulf of Sibuguey there are practically inexhaustive deposits of coal; in Cagayan de Misamis and Surigao, as well as on the headwaters of the Rio de Grande, gold is found, while copper in large quantities abound.

Of several of the larger and more prominent islands very little outside of their fertility is known. This is true of Negros, with an area of 4,854 square miles, Paragua 3,937 square miles and Mindoro 3,972 square miles.

The combined area of these three islands is 12,763 square miles. The combined area of the Hawaiian group is 6,740 square miles. The estimated value of the sugar crop of Hawaii this year is placed at $28,000,000. What would be the estimated value of the sugar crop and other crops of Negros, Paragua and Mindoro, possessing nearly double the area of Hawaii, if the soil were cultivated by American intelligence?

The area of other islands of destined importance is as follows:—Samar 5,040 square miles, Panay 4,708, Leyte 2,713, Cebu 1,742, Bohol 1,439, Masbate 1,290. Each of these islands is teeming in riches. Each possesses vast areas of timber, agricultural and mineral lands, which make exaggeration puny in describing.—*Manila Volcano*, March 8.

COMPETITION OF INDIAN COAL IN CEYLON.

In view of the fact that Colombo is one of, if not the most important British coaling station in the East, it is somewhat disconcerting to find that Ceylon is becoming so large a user of Indian coal. This coal imported into Ceylon is drawn from Bengal, and the quantities imported since 1894, according to Prof. W R Dunstan's report to the Society of Arts, have been as follows:—

	Tons.
1894	61,586
1895	47,566
1896	67,417
1897	105,213
1898	213,852
1899	163,908
1900	335,346
1901 (For 9 months, Jan. 1 Sept. 30)	260,869

From this it appears that the tonnage is increasing rapidly, the greater part being for the supply of steamers calling at Colombo; but about 40,000 tons a year are now being consumed on the Ceylon Government Railway.

The chemical analysis of some well-known Bengal coal is as follows:—

	Per Cent.
Carbon fixed	65·75
Volatile matter	26·05
Ash	6·55
Moisture	1·65
	100·00

The objections to Indian coal as compared to Welsh coal are that the former leaves more ash, and consequently about 25 per cent more is required to accomplish the same amount of evaporative work, but steamers are finding it so much cheaper than Welsh coal that it is being more largely used every year, and there is every likelihood of it coming into general use for all but mail steamers, which require Welsh coal on account of the speed required to be maintained. Indian coal is used by industrial establishments in Colombo, such as ice factories, the electric car generating depot, &c., but the quantity thus consumed is not large.

The consumption of Indian coal by steamers is likely to expand rapidly, for, as new steamers are built, provision is made for draught in the furnaces such as will admit of its being used more generally; and, in a measure, this will tend to the displacement of Welsh coal.

The following remarks are taken from the reports of locomotive engineers of the Ceylon Railways, which have recently largely used Indian coal:—

"In 1897 the increased expenditure was chiefly brought about by the cost of Welsh coal having jumped from an average of R18·50 per ton in 1896 to R27·62 in 1897. This tremendous increase in the price of British coal would have had a still more serious effect upon the working, had it not enabled Indian coal to compete successfully with it, and during the year 8,081 tons of Indian coal were consumed at an average cost of R13·09 per ton. Indian coal, under the most favourable conditions, shows an inferiority to the best Cardiff coal of 17 per cent on the low-country main line, and on the upper main line sections on the grades of 1 in 44, from 30 to 33 per cent inferior. The use of this coal on these grades gave considerable trouble, as the large consumption per mile on the up journey, namely, 140 lb per mile, left so much residue in the fireboxes after a 20-mile run, that it was absolutely necessary to clean the fires to such an extent that time was invariably lost.

"The altered grate arrangements also permitted considerable quantities of burning coal to drop into the ash pans and from them on to the sleepers, which gave rise to several complaints from the permanent way staff. The coals burned were Borrea, Anthracite, Giridih and Singareni, the most economical and suitable being Giridih, but the continued use, even on the lower sections, will to a great extent be governed by its relative cost compared to Welsh coal. At the price paid for it during the year it is in very close competition with firewood.

"A saving of R113,000 was effected in the running charges by the use of Indian coal during 1898. The general adoption of Indian coal instead of Welsh coal has very considerably reduced our locomotive expenses; so much so in fact that the consumption for the year shows an increase of 3,800 lb per train mile, yet in consequence of the cost of Indian coal (including handling) having been less by 10 per cent per train mile, the result has been a saving of R113,000.

"In 1898 fuel consumption increased to 99 lb per English mile and 5·30 per train mile. This increase was due to the large use of Borrea coal, which gave considerable trouble throughout the year."

Indian coal at the pit's month is probably lower in price than in any other country, often reaching 2 rupees a ton. The local wholesale selling price of Bengal coal was 4s. 5d. a ton in 1901, as against 4s. 2d. in the previous year. The wholesale price for imported coal in Calcutta averaged 32s. 1d. per ton.—*Iron and Coal Traders' Review.*

PROFESSOR HERDMAN IN CEYLON.

(To the Editor of the *Liverpool Daily Post.*)

SIR,—Enclosed is a third letter from Professor Herdman, just received, as full of interest as the former ones,—Yours, &c.

ISAAC C. THOMPSON.

53, Croxteth-road, Liverpool.

Gulf of Manaar, January 30th, 1902.

My dear Thompson,—I have now been ten days in Ceylon and, although first impressions are not always correct, still I should be ungrateful were I not to say how interesting everything is, and how exceedingly kind and helpful I have found everyone from the Governor downwards. They all seem to take a personal interest and pleasure in facilitating my arrangements and, as the result, the Oriental tendency to delay, and difficulty in getting unusual things done in a hurry, of which I had heard so much, has been reduced to a minimum. They have chartered a fine steamer for my work—the "Lady Havelock"—of over 300 tons, with a crew of 40, and we have made a start today. We dredge from a boom lashed to the boat davits at the stern, and trawl from a derrick on the fore-mast. I look after these operations, and Mr Hornell works the tow-nets. We have a laboratory with two good work-tables on deck under an awning, and the microscopes, dissecting instruments, tanks, jars, note-books and specimens scattered about give the place a familiar and home-like appearance, reminding one of the deck of the old "Hyæna," except that most of the faces round me are black instead of white.

After a couple of days spent in official visits and business in Colombo I found that the necessary arrangements on the steamer would take a week to complete, so, leaving Mr Hornell to superintend these, and see to the unpacking of our scientific gear, I set off to find several men in the island from whom I knew I could get important information bearing on the pearl-oyster work. First, there were two former students of mine at University College, both now occupying important scientific positions here, viz., Dr. A J Chalmers, Registrar of the Medical College and lecturer on biology and allied subjects, and Mr J C Willis, Director of the Botanic Gardens at Peradeniya. Both those gentleman kindly met me on my arrival, and have been most hospitable and helpful. Dr Chalmers has given me the use of a room in his laboratory at Colombo, and Mr Willis has offered a work place in his laboratory at the magnificent Peradeniya gardens. I went to Kandy and Peradeniya to see what use could be made of the laboratory, and to meet Mr Oliver Collett, who has written on the pearl fisheries. Then I found upcountry, at Anuradhapura, (one of the "buried cities" of Ceylon) the two Germans, Dr Paul and Dr Fritz Sarasin, who have been exploring for years in Ceylon, and were the only people who could give me information about Trincomalee, where I wish to dredge. Finally, I met Professor Alex. Agassiz, just returned from his expedition to the Maldive archipelago, and he kindly lent me 600 fathoms of especially strong and flexible steel rope, which will be a valuable addition to our tackle. Professor Agassiz, you will be interested to hear, says he has had a most successful trip, and has secured all the information, photographs, and specimens of the Coral Reefs that he desired. He says the Maldives is the last of the great coral archipelagoes which he had set before himself to examine and that now he is prepared to write his book on the general subject, "Coral Reefs and Islands." There can be no doubt that he has a much more extended personal knowledge of the reefs of the world than Darwin, Murray, or any other previous writer.

Anuradhapura, where I met the Sarasins, is an extraordinary place, consisting of the magnificent ruins of a very ancient city, which until a few years ago was buried in jungle. Many miles of it are still in the jungle and unknown, I was told by the Archæological Commissioner, who is digging it out with about ninety coolies, half of whom are down with malaria every day. [I noticed that my mosquito curtains at the "Rest House" had large holes in them.] This city was the capital of the ancient Cingalese kings, and was commenced, I believe, in the third or fourth century B.C.—let us say the time of Aristotle. It was deserted when the Tamils invaded the northern part of Ceylon. The most remarkable pieces of work are the enormous temples, the bathing tanks, and the beautifully-carved stones, showing kings, queens, Buddhas, seven-headed cobras, and curious little fat dwarfs, who may be meant to represent the aborigines—the Veddas. One of the temples (Dagobas) is said to contain enough bricks to build a wall ten feet high and one foot thick from London to Edinburgh.

The last matter I can mention now is the jungle, and I have found my first experience of it most fascinating. I wish the Biological Society could come and have a day of it with me, and see the Wanderoo monkeys come crashing down from the tops of the trees one after another, swinging themselves up again

by a slender branch just when you think they must certainly come to grief on the ground. I had three hours' drive through a jungle road in a bullock cart after dark, from Anuradhapura to Mihintale, with two men who were able to tell me about most of the sounds we heard around us.

Now that we are at sea again our hands will, I hope, be kept very full of work; but I shall try to write to you soon something about the marine zoology of the Gulf of Manaar.—Yours &c. W. A. Herdman.

'POOR' COFFEE, RUBBER, COCO-NUTS, &C.

(Extract from Selangor Planters' Association Annual Report for 1901.)

Planting Products: Coffee.—Prices ruling during the year have shown a decrease from those of 1900 an average of $18.29 per picul, or $2·60 per picul less than the average for last year, which was $20·89. Notwithstanding these low prices, which necessitated the strictest economy, the estates are almost all in good order, and planters are showing great determination to tide over the present crisis which has lasted so long. The reports from coffee brokers are so conflicting that we consider it best to quote from none of them: but the following is an extract from one of the leading merchants in Singapore in answer to a letter written by one of your Committee:—"I would be delighted to assist you with my views on the future of coffee in Brazil, if I had any, which, however, does not happen to be the case. I had a talk with —— the other day, and he told me that no fresh planting had been reported from Brazil for *some years now*: and that there was no doubt but that the trees were getting old and worn out, and that it was very improbable that we should see such large crops again. The fact remains, however, that the visible supply is simply enormous, as you will see from the Circular I send you." The following is an extract from a letter from Santos, in answer to some questions made by one of your Committee, received on 13th February, 1902. "Tell —— that the coffee crop for next year is very poor, and will only be about half its usual size, so that prices are sure to go up. I hope to get up to San Paulo next year," etc. It will be remembered by many of you that Ceylon's greatest crop was its last big one. Galaha in that year topped all estates by giving 17½ cwt. per acre, but never gave 4 cwt. per acre again. There is at least something to hope for in all the above. Crops.—The crop realised for last year was 19,365. and the estimate for 1902 is 27,146 piculs. Your Committee consider that the sample of your coffee has improved on almost every estate, and they urge on you the importance of doing everything in your power to continue to improve it.

Para Rubber.—We can now speak with great confidence to you, for during the year vast strides have been made in this cultivation, the acreage planted now being 7,487, 247,458 trees having been planted during 1901. This is not so much to the point as the fact that careful and detailed experiments have been made in tapping our trees of all ages, not only by such men as the Directors of the Botanic Gardens of Singapore, Penang and Perak, but by many of the planters now present, who have proved their figures to be correct. "I have not seen any published accounts on *Hevea* (excepting Brazilian) where as good results are obtained as in Malaya, either in rate of growth, seed production, dimensions, yield and adaptability." The most casual observer must notice the magnificent growth of nearly all the rubber planted in the Malay Peninsula, and especially that on the well-drained alluvial soil of which we have so much. During the year two well-known rubber experts from Ceylon visited Selangor and Sungei Ujong, and they stated that they had never seen a better growth, and they seemed astonished at the large returns per tree got by Mr Derry and others and at the free flow of latex from our young trees. We think there can be no doubt that a paying future is before the industry, and that ultimately the Malay Peninsula will oust Brazil from her present position as the premier rubber-producing country of the world. This is a bold forecast, but not an unreasonable one. Before it comes about there will, of course, be a heavy drop in the price of the product, and we would put before planters a few facts to enable them to judge our ability to hold our own in competition with Brazil.

Rambong.—The planting of *Ficus elastica* has been considerably extended during 1901, 34,804 trees having been planted, or equal to say 700 acres. Rambong is growing magnificently and promises to give quite as good returns as Para, the yield per tree being much larger, which makes up for the lesser price and a smaller number per acre.

Coconuts.—The area under coconuts is 3,008 acres. There is no doubt about the success of this product if the ravages from beetle could be checked, and we think the matter so serious that we consider the Government should be strict in carrying out the powers they have under the Enactment. Somewhat pessimistic views have been expressed by men qualified to pass an opinion as to the crops which our coconuts on the rich alluvial are likely to yield. On a small holding in Klauang district, now about 10 to 12 years old, the average yield per tree amounted to 51·5 nuts in 1901, and for the first eight years of its existence this little clearing never had any sort of intelligent supervision. Your Committee, therefore, think that it is not unreasonable to hope that returns over a large acreage may be such as will astonish those who hold that the maximum yield will not amount to more than 20 to 30 nuts per tree.

Minor Products.—The planting of catch crops is chiefly done in the coast districts: but it has been found that the planting of small catch crops, such as pumpkins and kladi, do not pay, as it is almost impossible to make the Chinese keep the land clean during their growth, and the whole of what is gained by the catch crops goes in what it costs to put the land in order after them—to say nothing of what the soil loses by them.

It is generally recognised that coffee, even at the present low price, is the best catch crop, and a large acreage is likely to be planted up with Para rubber clearings next year.

SIR E. N. WALKER ON JAMAICA.

At the Society of Arts after the reading of a paper on Jamaica, our former Lieut. Governor said:—

As it was more than 14 years since he severed his connection with Jamaica, he could not speak with authority on its present condition. Like Mr Thomas, he had been surprised that Jamaica fruit had not found a firmer and wider hold in England. He had brought pines from Jamaica and distributed them in Devonshire amongst people who were accustomed to hot-house pines and the remarks they had made after the practical experience of eating them were very favorable to the fruit. One thing in favour of the Jamaica pineapple was that one never committed the offence of eating sugar with it and he thought that proved the superiority of the Jamaica pine. The enterprise of introducing the banana into this country had not reached the success which he thought it certainly deserved, owing to its excellent character. In appearance it certainly did not compare favourably with its rival which was exported in large quantities and in excellent condition from the Canary Islands. He thought the shippers had not yet hit off the precise condition of ripeness in which the fruit should be shipped. With a friend he had purchased in the City of London a Canary Island banana and a Jamaica banana, and they were both of the opinion that the Jamaica banana had the better flavour. Unfortunately it did not possess the fine, almost golden

bloom of its Canary Island rival, and therefore, housekeepers in purchasing the fruit for table were liable to overlook the Jamaica banana. He could also bear testimony to the worth of the Jamaica cigar and had heard on very high authority that there was no reason why Jamaica should not grow as good tobacco and turn out as good cigars as Cuba. He was particularly pleased to hear the tribute Mr Thomas had paid to the Jamaica Negro who was not such a bad fellow as he was very often made out to be. In support of that contention one simply had to ask, Who did all the hard work in the Panama Canal? It was done by the Jamaica Negro. The contractor for one of the smaller railway extensions carried out in the Island of Jamaica, Mr Murray Campbell, had said that in a large experience with various classes of labour he was perfectly satisfied with the Jamaica labourer at 1s. a day. In the past difficulties had arisen which had stood in the way of better relations between the employers and the employed; but that was not to be wondered at when a similar state of affairs had existed between the employers and employed in England. He felt extremely grateful to Mr Thomas for his extremely interesting peper.—*Journal of the Society of Arts*, Feb. 7.

PLANTING NOTES.

THE TAMED ZEBRA A SUCCESS.—Evidently the taming of wild zebras is proving successful. The "Official Gazette" (Mombasa) contains an advertisement that Baron Bronsart von Sheblendorff, of Kilimanjaro, is prepared to supply tamed but unbroken zebras at 200 to 300 rupees each, and tamed and broken-in animals at just twice that price. Orders can be executed in nine months.—*Daily Mail*, March 11.

A RAILWAY TO NYASSALAND.—It will be seen from the following paragraph from a recent number of the "Scottish Geographical Magazine," that the time allowed the Shire Highlands Railway Nyassaland Company, to raise its capital expired on the 3rd instant :—

"The Shire Highlands (or Central Africa) Railway. —Many of this Society and readers of this Magazine will be gratified to learn that an agreement has been concluded, on the 3rd of September between the Government and the Shire Highlands Railway, Nyassaland Company, for the construction of a railway in the British Central Africa Protectorate. If the Company provides within six calendar months from that date a certain sum of money to be devoted to the construction of the Central Africa Railway, the Government by the Crown agents will enter into a contract with the Company. The prescribed sum is to be raised by an issue of Debentures of the Company constituting a first charge on all the present and future assets of the Company. The railway is to start from Chiromo and thence proceed to Blantyre, and subsequently to Lake Nyassa. The Company is to have the use of plans, surveys and reports in the possession of the Government, but the Government may require an additional survey to be commenced within three months from the *date* of the contract and completed within nine months, and the railway commenced within fifteen months from the same date. The railway is to be built in sections of twenty miles."

We cannot tell yet if the Company had been successful, We hope so.

DISTRICT PRICES AND REDUCTION OF TEA OUTPUT.—It is worthy of note—says *Indian Gardening and Planting*—that Dooars, the only Indian tea district that does not show a reduction in the crop of 1901, is the district which has obtained the greatest benefit from the rise in prices at home since the middle of last year. Up to the beginning of February the average of all Dooars tea sold on garden account this 1901-02 season is 6 84d, a full penny better than in the corresponding period in 1900-01. The average of all Indian teas sold on garden account during the same period is only a half-penny better than in the previous year, so Dooars has done the best of all districts in this respect notwithstanding a bad start.

A STATE LABORATORY FOR STUDYING PLANT DISEASES.—A correspondence has been taking place in "Nature" between Mr. W. Carruthers of the British Museum and Sir W. T. Dyer of Kew on the need for a State Agricultural Laboratory where the diseases of plants can be investigated and remedies found by experiment and other means. The question arose in a statement made by Mr. Carruthers at the Royal Microscopical Society, of which he is President, as to this national want. Sir William Dyer considers that Kew already fulfils this want by naming fungi which are sent to them, but Mr. Carruthers refers to a recent case of cherry disease in which the steps which prevented the spread of the evil, were taken by the Royal Agricultural Society and by private individuals, and not by Kew or the Board of Agriculture. As a colony we are ahead of the old country in employing Government officials to devote themselves to these important matters.

OPHIR AND TARSHISH.—In reviewing a new book, "The Gold of Ophir," by Professor A H Keane, the London *Times* says :—

The site allotted to Ophir must stand the test of many conditions. Professor Keane decides, we think rightly, in favour of the south of Arabia, the country known as the Hadramant, the ancient Himyaritic territory. Ophir was a great city or emporium of which Moscha, about half way along the southern coast of Arabia, was the port. It was not the place at which the gold and other products to which it gave its name were found; it was the emporium to which the products of the East and the South were brought, and from which they were distributed by the enterprising Yemenites through the medinm of the Phœnicians and other navigators who made use of the Red Sea as a great trade route. Professor Keane, in coming to this conclusion, agrees with some distinguished predecessors, though no one before him has adduced nearly so much evidence in support of it. The same may be said of the arguments by which he proves that the gold imported into Ophir and re-exported for the use of Solomon and other potentates could only have been furnished by the rich gold-bearing country lying to the south of the Zambesi, which Professor Keane identifies with the Scriptural Havilah. Recent explorers of this territory, which is now British—especially Messrs. Hall and Neal, to whose work Professor Keane expresses himself as greatly indebted—have satisfied themselves that gold eqnivalent to many millions sterling must have been extracted from these mines by the Sabæan Arabs and the Phœnicians who succeeded them. Tarshish Professor Keane identifies with the modern Sofala, though here his evidence is not quite so strong; while the land of Punt he locates with much probability in the north-east horn of Africa.

ORIGIN OF PEARLS.

William Bateson, Esqr., F R S, Vice-President, in the Chair.

Dr H Lyster Jameson, M A, read a paper "On the Origin of Pearls." The author's observations referred especially to *Mytilus edulis*, the Common Mussel. The Pearls were found to be due to the presence of parasitic Distomid larvæ, which entered the subcutaneous tissues of the mussel and became surrounded with an epidermal sack similar in its character to the outer shell-secreting epithelium of the mantle. If the *Distoma* died in the sack it became calcified, and formed the nucleus of a pearl; the pearl arising, like the shell itself, from the calcification of the cuticle of the epithelial cells. The parasite sometimes migrated out of the sack, in which case the nucleus of the pearl was inconspicuous.

Dr Jameson had investigated the life-history of this parasite, and found that it arose as a tailless Carcarian larva, in sporocysts, in *Tapes decussatus* and *Cardium edule*. He had succeeded in infecting Mussels from *Tapes* in an aquarium. The adult stage of this parasite was apparently *Distoma somatinæ* Levinsen, which occurs in the intestine of the Eider Duck, and which the author had found in the Scoter or Black Duck (*Œdemia nigra.*)

The complicated life-history of the parasite, and the absence of organs of locomotion in the *Cercaria* stage, sufficed to account for the anomalous and hitherto inexplicable distribution of pearl-bearing Mussels.

Dr Jameson had found that pearls were caused by similar parasites in several other species of Mollusca, including some of the Pearl-Oysters; and he believed that the artificial infection of the Pearl-Oysters could be effected in a similar manner to that which he had found successful in the case of the Common Mussel. When this was achieved the problem of artificially producing pearls would be solved.—*Zoological Society of London*, March 14, 1902.

CEYLON GREEN TEA VERSUS CHINA AND JAPAN.

THE MARKET IN CANADA: GREEN TEA WITH A GREEN COLOUR WANTED,

CANADIAN CRITICISM AND CEYLON OPINION,

In the last issue of the *Canadian Grocer* which reached Ceylon some astonishing statements are made in commenting upon the views of Mr Galt on Ceylon Green Teas. The writer, who it would appear poses as an authority on the Green Tea Trade in Canada, refers to Mr Galt as "A Mr Gault," as if he were some obscure retailer of Green Tea, whereas as we understand Mr Galt directs the management of the largest Indian and Ceylon Tea business in America—the Anglo-American direct Tea Trading Company. At the outset this would appear to indicate malice or ignorance on the part of the writer, who then goes on to state:—Mr Galt declares that green tea as turned out by the factories in Ceylon is not properly made. It is, he says, "neither a green nor a black tea." And again in answer to a question regarding the demand in the United States and Canada, he adds:—"Not a pound of Ceylon green tea would be sold in America at present were it not bolstered up by money and other presents given away with a pound of tea." Mr Galt's remedy for the defects which he alleges to exist is the firing and packing of the green teas after the manner of the factories in China and Japan. We gather this not only from the reading of the interview with him but, from a conversation we have had with a teamen who in turn, not long since, discussed the subject with Mr Galt himself in London, prior to his departure for Colombo. The firm with which Mr Galt is connected has arranged to manufacture and pack Ceylon green tea after the manner of Japan and China, and the result of the experiment will be watched with a great deal of interest. As far as we can gather, opinion is divided in both Canada and the United States in regard to the wisdom of the new departure which the Anglo American Direct Tea Trading Company is taking. To the tea manufactures in Ceylon, and those dealers in the United States and Canada who are ardent champions of Ceylon greens, the proposition to adopt the tea-making methods of the competitive countries is no doubt somewhat humiliating. And furthermore, to make the leaf after the styles of China and Japan would certainly tend to deprive the Ceylon article of its individuality, as far as appearance at any rate is concerned. But looked at from the standpoint of utility, the question seems to resolve itself into this: Which method is going to be, in the long run, most conducive to the welfare of the tea industry of Ceylon? And this can only be ascertained by experiment. The logical conclusion, therefore, appears to be—go ahead with the experiment. We cannot agree with Mr. Galt's statement that "not a pound of Ceylon green tea would be sold in America were it not bolstered up by money and other presents given away with a pound of tea. We are not prepared to speak for the United States. But, as far as Canada is concerned, they are simply exaggerations. And, according to Talleyrand's maxim, "Everything which is exaggerated is insignificant." A year ago the sale of Ceylon Green Tea was undoubtedly stimulated by the fancy 60 lb canisters given to every retailer who purchased a certain quality of the tea. But we are not aware of any prize or consideration of any kind being given to consumers. At present there is quite a scarcity of Ceylon green tea on the Canadian market and the demand being in excess of the supply, prices are much higher than they were a month or two ago. No doubt the demand is to some extent stimulated by the extraordinary scarcity and dearness of China green teas. But that does not alter the fact that the teas are selling and that without prizes attached thereto. Nor does it strengthen Mr Galt's case, because the tea package firms are by far the largest purchasers of Ceylon green teas. Whether Ceylon green teas will ever take the place of Japan and China greens remains to be seen. There are some who strongly maintain that they will. Others again are just as strong in the contrary view. Although there was a large increase in the importation of green tea of Indian and Ceylon growth last year, the quality is still relatively small when compared with China and Japan green teas. The importation of Ceylon and

Indian green teas into Canada during 1900 and 1901 were as follows:—

	1900.	1901.
Indian green, lb.	23,214	81,578
Ceylon ,,	27,175	334,634

Japan and China greens imported during the same periods were as follows:—

	1900.	1901.
Japan greens, lb.	8,520,781	6,645,337
China ,,	1,235,197	863,586"

MR. GALT'S VIEWS ON THE CANADIAN CRITICISMS.

Seen by a representative of the *Observer* this morning Mr. Galt said that he had read over the criticisms of the "Canadian Grocer." He was of opinion that the article had simply been inspired by one of the "ardent champions" which it referred to. The writer was

UNABLE TO REFUTE A SINGLE STATEMENT

he had made in connection with the manufacture of Ceylon Green Tea. It seemed that the "Canadian Grocer" had stooped to a purely personal attack. With regard to the remarks which that paper described as "exaggeration" Mr. Galt has no recollection whatever of making so broad a statement as is attributed to him. He is, however, in possession of a letter, received last mail from Toronto in which the writer states that after making careful enquiry he finds that no wholesale Grocer in the city of Hamilton handles Ceylon Green tea and that only two wholesale Grocers in Toronto make a practice of handling it, while their outlet is but for a limited quantity at from 5½d to 6d. Mr Galt's correspondent also informs him that about a year ago the wholesale grocers of Toronto and Hamilton were each induced to handle 200 to 300 half chests of Ceylon Green Tea

BY PRESENTING THEM WITH CANISTERS

which were again in turn handed over by them to the retailers as an inducement to the retail trade to purchase the tea. Since the canisters have stopped, the sale of the Ceylon Green Tea has stopped. The package tea concerns in Canada put up what is called a mixed Ceylon Tea. Mr Galt thinks that possibly a good deal of the so-called Ceylon Green Tea is disposed of in this way. (The "ardent champions" probably drink the rest themselves.) The *Canadian Grocer* states that the manufacturers in Ceylon will be humiliated by the introduction of such machinery as would enable them to make

TEAS THAT WOULD COMPETE SUCCESSFULLY

with those made in China and Japan. Such is surely an erroneous idea. The object of the manufacturer is surely to produce a Green Tea acceptable to the taste of the people and which will get a market on its merit and not require to be bolstered up by canisters or forced upon the people. So far as the "ardent Champions" are concerned Mr Galt thinks they have been well-paid for their work and, therefore need not be seriously pitied. It is, he says, a generally accepted principle among business-men to give people what they want instead of trying to make them buy something else. The demand is for

A GREEN TEA WITH A GREEN COLOUR

and it is only such a tea that is likely to find a ready of market in America. Whether Ceylon will, eventually, be successful in introducing its present style of manufacture remains to be seen, but Mr Galt thinks it will furnish employment to Commissioners for many years to come before such an end is attained. In conclusion Mr Galt said that the only point of importance which he observed in the article in question was that after weighing all the *pros* and *cons* the "Canadian Grocer" came to the conclusion that the Anglo-American Tea Trade Company were doing the logical thing in carrying on their experiments to make a Ceylon Tea that people will buy.

TEA SALES.

PUBLIC SALES OF TEA IN COLOMBO.

FOR THE 1ST QUARTER ENDING MARCH 1902.

Date.		Offered	Sold	Avg. 1902.	Avg. 1901.	Exchange. Demand Drafts 1902.	
		lb.	lb.	c.	c.	s.	d.
Jan.	3	1,493,593	1,020,013	3	27	1/4	1.32
,,	8	646,988	565,268	36	31	1/4	1.32
,,	15	1,120,132	752,067	34	29	1/4	1.32
,,	22	1,375,393	1,050,692	33	27	1/4	1.16
,,	29	930,113	600,060	32	27	1/4	1.16
Feb.	5	784,641	591,461	33	30	1/4	1.32
,,	12	768,910	651,783	34	29	1/4	1.16
,,	19	1,011,108	775,306	34	29	1/4	1.16
,,	26	891,360	680,597	35	30	1/4	1.32
Mar.	5	847,998	684,470	36	34	1/4	1.32
,,	12	839,768	685,687	37	35	1/4	
,,	19	1,176,128	941,572	36	36	1/4	
,,	25	1,097,693	813,233	35	37	1/4	
Total ¼	1902	12,983,825	9,812.209	34½	31	1/4	1.32
Do	1901	12,531,942	9,604,377	...	...	1/4	...

PUBLIC SALES OF TEA IN LONDON.

FOR THE 1ST QUARTER ENDING MARCH 1902.

Date.		Packages Offered.	Packages Sold.	Reuter's Average. 1902.	Gow, Wilson and Stanton's Average. 1902	1901.
Jan.	2	11,000	9,000	7½	7½	7
,,	9	21,000	20,000	7¾	7½	6⅝
,,	16	32,000	29,000	7⅜	7⅜	6½
,,	24	26,000	24,000	7½	7½	7½
,,	30	27,000	25,000	7¼	7¼	6¼
Feb.	6	28,000	24,000	7	7	6
,,	13	26,000	23,000	7	7	6
,,	20	23,000	22,000	6⅞	6¾	6⅜
,,	27	26,000	24,000	7⅛	7⅛	6½
Mar.	6	21,000	20,000	7⅛	7⅛	6⅝
,,	13	25,000	23,000	7⅛	7	6½
,,	20	23,000	21,000	7⅛	7	6¾
,,	27	25,000	22,000	7	7	7
Total ¼	1902	...314,000	286,000	7¼	7¼	6½
Do	1901	...375,000	338,000	..		..

[The figures for Local Sales are compiled from the weekly circular of Messrs. Forbes & Walker, while those for London Sales are from the telegrams received weekly.]

THE NEW CEYLON GREEN TEAS.

7th April, 1902.

Messrs. Forbes & Walker, Colombo, have furnished us with the following opinion, at our request, of the green teas being produced under Mr. Galt's direction, as alluded to in our interview with Mr. Galt on Saturday:—

"The favorable opinion we have formed of the samples of 'finished green tea' made by Messrs. Finlay, Muir & Co's factory and shown to us from time to time by Mr. Galt will, we think be shared by most of those who carefully conside

he subject. These teas are made to closely imitate China and Japan greens, in make, color of leaf, and style of liquor; young Hysons (including the small leaf Sow-Mee), Hysons and Gunpowders being cleverly copied. In liquor they compare most favourably with Chinese and more than favourably with Japans, the crowning point being their purity and freedom from scum or coloring matter; and we feel confident that such teas will have the effect of overcoming a great difficulty now existing in bringing Ceylon Green teas into consumption in places where at present Chinas and Japans are used; for it stands to reason that it should be a comparatively easy matter to introduce teas whose character is so akin to those of our Eastern rivals into such countries, and when once adopted they will doubtless be preferred by the consumers in the same ratio that our black teas are in other parts of the world.

"Green teas now being made in the various factries of Ceylon are generally speaking sound and good, particularly in cup; but they are undoubtedly at a disadvantage as regards appearance of leaf when competing with China greens—a disadvantage which should not be experienced with the finished green teas.

"As far as we know this is the first attempt made in Ceylon to produce a tea of true green character in the full meaning of the term, and we cannot but think it will be attended with success."

COCONUTS AT PENANG.

Mr. Curtis writes in his report on the Botanic Gardens, Penang:—

The cultivation of Coconuts is one of the most important and profitable industries in this part of the world, and one in which perhaps a greater number of individuals are interested than in any other. A few Europeans in this Settlement own large plantations, and in the Native Malay States some have planted on a considerable scale; but on the whole it must be looked on mainly as a native proprietor's crop, and in their interests it is important that the destructive beetles be kept in check. When I first came to Penang $10·12 was about the price per 1,000 nuts and this was then considered a paying price. In recent years the price has ranged from $25·30 with a ready market for any quantity. A large proportion of the Penang and Province Wellesley crop is shipped to Rangoon, where the product is used as food in the form of curries, sweetmeats, etc. Both in England and Germany coconut butter is being manufactured on an extensive scale, but the low temperature at which it becomes liquid militates against its introduction here.—*Singapore Free Press*, March 26.

THE FOREST WEALTH OF TRAVANCORE.

Trevandrum, March 18th.—Mr T Ponambalam Pillay, the Acting Conservator of Forests in Travancore, delivered a very interesting lecture on the "Forest Wealth of Travancore" a few days ago.

FOREST PRODUCTS.

Major and Minor produce was the definition which embraced all the produce obtained from our forests. Timber and fuel were the two that were classed under Major produce. The Acting Conservator estimated that there were about 1,000 different kinds of trees and shrubs which it was worth while to study. So finely was this distributed that on an examination of a particular Reserve he found that there were the 24 species of the trees reserved in Travancore in each square mile. To reserve 24 trees was not an exorbitant demand on the part of the Government. The fact was that only a few kinds of timber were exploited and used in Travancore. There were several valuable species—valued in other lands which are not noticed here—notably iron wood (*Xylia delabreformis*). There were enormous quantities of firewood to be had for the mere transporting charges, and yet no one cared to do a business in it. In the towns of the State fuel was so scarce that coconut shells and the leaves of trees, etc., were being utilised as fuel, and if depôts were established by private persons a profit of 10 per cent could be fully depended on. Again, enormous quantities of timber in the shape of waste, from fellings by Government contractors, and chips were allowed to rot. The sapwood of all coloured trees and the entire volume of all colourless trees, provided they contained cellulose, could be utilised for wood pulp, which in its turn was suitable for paper making. Roughly speaking, one quarter of the original weight of timber could be obtained in wood pulp by a process which the lecturer described. It was largely in demand and Great Britain and Ireland annually imported the material for 4 millions sterling.

OTHER PAPER-MAKING PRODUCTS.

First there was the fibre of the bamboo, the *Eta* or *Vai*, the wild sugar-cane (*Saccarine arundariacea*), the refuse of sugarcane mills, the aloe, the plantain, also a number of palms and cycads which could be utilised, and which were now absolutely rotting away or burnt for manure. The common dhoby's earth was to be had in abundance in the country, and from it could be obtained the caustic soda so essential in paper making. Thus, there were in the country two of the most important materials required for paper manufacture. The locally established paper mill was not successful owing to inexperience and scant knowledge of the surroundings. Expensive English chemicals had to be obtained. In North India some of the paper mills made their own caustic soda.

OILS AND RESINS.

Enormous quantities of the heart wood of teak were wasted annually, and yet from this an essential oil much in demand was obtainable. Sandalwood oil was another valuable product if sufficient attention was paid to it. Among other trees from which resinous matter could be obtained with profit for local or Indian consumption were:—*Odina wodier*, the dhoby's nut (*Semicarpus anacardium*), *Acacia Arabica, Albizzia Sebbeck, Vateria indica, Ailanthus Malabaricus Ailanthus excelsa, Petrocarpus marsupium.* From this last the well-known gum kino was obtained, and though the tree was felled in abundance, no regular recognised branch of trade existed in the product.

TANNING AND DYEING.

There were openings in these industries for enterprising people. They were very profitable industries, and there was a large quantity of tanning products in the country which remained

unutilised either in tanning in the country or in exporting the tanning agents. The same could be said of matter suitable for dyeing and for varnishing.

ROOTS.

Ginger, turmeric and the kina (*Curcuma angustifolia*) were plentiful in parts. There was not much difference in the product known as the arrowroot of commerce which was exported from Europe and the arrowroot made from the kina cultivation would improve the quality of the bulb.

CARDAMOMS AND CINNAMON.

These were valuable products, and there was a host of others (some of which were mentioned) which could be traded in. The importance of obtaining useful botanical specimens was dwelt upon.

SOAPS.

There were things requisite for the manufacture of soap, viz., fats, oils and alkaline, all three obtainable in Travancore. Lemon grass oil was in great demand, and though there was some business done in it, it was not nearly so large as it could be made.

MINERALS.

There was gold in Travancore, but not in paying quantities. At Shencotta, there was iron ore, and pig iron could be made, for there was an abundance of charcoal. Mica abounded and, lastly, plumbago, which was so successfully worked by the Morgan Crucible Co.

ANIMAL PRODUCTS.

Honey was abundant and apiculture was a field for a new departure, as well as that of the rearing of silkworms. There were a large number of trees on which silkworms fed.

The lecturer said Travancore was unique, inasmuch as she contained within her boundaries variations of climate and soil in which most things wanted by the civilised world could be obtained. Rubber had thrived in Travancore, and new varieties were bound to do well. Camphor cultivation was worth a trial. The lecturer concluded by saying that the rising young men of the day should try and strike out a new line for themselves in industrial matters. Government service was a good thing, but all could not be Government servants.—*Cor.—M. Mail*, March 21.

RUBBER DEVELOPMENT IN BOLIVIA.

During the year ended 1st July 1900, the government of Bolivia granted new concessions for working rubber as follows:—

	estradas
Department of La Paz	7264
Department of Santa Cruz ...	9590
Department of Cochabamba ..	500
Total................	17,354

Since each *estrada* is supposed to embrace 150 rubber trees, these concessions would account for 2,603,100 trees brought under private control within a year. It is understood, however, that many small rubber properties in Bolivia are for sale, due probably to a lack of working capita on the part of the *concessionaires*, while perhaps some of them have been located only with a view to selling them.

A statement has reached The India Rubber World that the following amounts of rubber paid export duties (15 per cent *ad valorem*) at the Bolivian custom house in the Acre river district—lately in dispute between Bolivia and Brazil—between January 29 and April 16, 1901, and were shipped via Para:

	Pounds
Goma elastica (fine rubber).....	2,954,879
Sernamby (coarse rubber)......	328,275
Caucho..............................	13,728
Total................	3,296,882

India Rubber World, March 1.

LESSER PRODUCTS OF THE COCONUT TREE.

There is really no part of the coconut tree which does not serve man for some economic purpose. At the same time considerable ignorance prevails regarding certain minor products of this palm, and the purposes to which the natives apply them. For instance, the soft, downy light brown cotton, at the outside of the lower part of the compound leaves of the tree, is very popular with physicians and housewives, for there is nothing to beat it in staunching blood from a wound. The mature cotton is a strong weblike tissue of fibres, bearing some resemblance to coarse cloth. Toddy drawers use it as a strainer, while in some parts of country it is woven into very tolerable wearing apparel, chiefly used by fishermen. Then, the roots are largely used by the natives for tooth and paint brushes, and are also sometimes chewed with betel as a substitute for arecanut. They have still more valuable uses, for the native vydian prescribes a decoction of coconut roots with ginger and jaggery in cases of fever. When fresh oil is added the mixture is prescribed as a gargle for sore mouth or throat. The shell of the coconut takes a high polish and can be "turned" in a most remarkable manner. It can also be converted into good buttons. Another minor product is the water inside the kernel. The supply diminishes as the fruit approaches maturity. There is no more delicious summer beverage. The water may be drunk freely without any deleterious effect, and the natives esteem it as a good purifier of the blood. Bricklayers use it in the preparation of a fine whitewash, and when a little of it is mixed with the water in which castor seeds are boiled the quality of the castor oil is highly improved. For the curing of tobacco, a little of the water sprinkled on the leaves improves them and adds to their flavour. The spathe or tough fibrous covering of the blossom makes rough but serviceable headgear, water buckets, light boxes, sheathes for knives, and when soaked in water, a coarse cordage which is substituted for ordinary rope for thatching houses. The flower, which possesses a powerfully astringent property, is used in native medicine. We have then the cabbage at the summit of the tree. This is a tender vegetable, which may be prepared in various ways, and is especially good for pickle, but it can be obtained only at the cost of the tree, and a native must be driven to great extremities before he cuts down a coconut tree. The finer midribs of the leaves are made into tooth picks, coarse pins, brooms, bird cages, and neat blinds, while the larger midribs of the compound leaves are occasionally substituted for the paddles of small canoes and boats. Fine strong cordage is also obtained from them. In short, the numerous useful products of this palm reminds us of Ludovico di Varthema's dictum: "Ten useful things are derived from this tree; the first utility is wood to burn, nuts to eat, ropes for maritime navigation; thin stuffs, which, when they are dried, appear to be made of silk; charcoal in the greatest perfection, wine, water, oil, and sugar,

and with its leaves which fall, that is when a branch fall, they cover the houses; and these ward off water for half a year. C.
—*Capital*, March 27.

PRODUCE AND PLANTING.

Rumour is again busy about the new taxes. Twenty millions of the deficit in the Exchequer have, it is estimated, to be raised by new taxation and once more there has been

TALK OF A FURTHER TAX ON TEA.

The one thing certain is that everything connected with taxation proposals is gloriously uncertain. Money has to be raised somehow, and if, in the general rake-in of funds, the Chancellor of the Exchequer, as is hoped, leaves the tea duty where it is now, there will be much to be thankful for. April 10 is mentioned as the probable date of the Budget speech.

A new paragraph has been added to the regulations for the entry and

EXAMINATION OF IMPORTED TEAS, AS ADOPTED BY THE UNITED STATES

Treasury Department. The regulations are practically the same as those of last year, with the exception of the following: "In examining Japan's Green Teas and Congous, while limiting the comparisons in the matter of infused leaf and scum to the specific standard called for, examiners are to admit teas upon the question of quality, in the three kinds above cited, provided they are equal, in the case of Japans, to either the Pan Fired or the Basket Fired standard; in greens to either the Country Tea or the Ping Suey standard; and in Congous to either the North China or the South China standard.

ON THE PROSPECTS OF THE TEA TRADE,

the *Grocer* points out that the statistical position of tea is difficult to gauge just now, in consequence of the dislocation of trade through the exceptional circumstances under which duty payments on the article were made a twelvemonth ago. "Despite the false impression which the statistics are calculated to create, the prospects for Indian and Ceylon tea must be pronounced," our contemporary says, "as very good. Although much difference of opinion has existed respecting the Indian crop as to shortage, the ultimate deficit does not turn out to be so large as was thought earlier in the season, and, according to the latest circular issued by the Indian Tea Association of Calcutta, the total crop of 1901-02 was 165,250,000 lb as compared with 177,500,000 lb in 1900-01. It may be added that the exports to London from April 1 last to February 28 this year reached 152,251,000 lb, in comparison with 160,830,000lb in 1901. A year ago the tea trade was in a very unsatisfactory state, with prices at an unprecedentedly low point—i.e., 2½d to 3½d per lb for common sorts—owing entirely to over-production. Since last August, however, quotations have been at a more normal level, with a slight upward tendency and occasional set-backs. Approaching nearer to the present date, there has been an increasing demand for the commoner kinds, which have become scarcer, and are much wanted for the chief 'canister.' In proof of this statement we have only to add that the value within the past fortnight has advanced about ¼d to ½d per lb., and for the next month or two all the lower grades of tea available will be required for immediate use. Ceylon shipments have of late been on a somewhat diminished scale, in spite of a lighter quantity and outturn in 1901 as compared with the previous season and the scarcity of finer qualities of both Indian and Ceylon descriptions has turned out to be unmistakable. In view of this fact it would pay growers to make superior teas, instead of resorting to indiscriminate plucking, whereby the markets at times are flooded with coarse, common sorts, which often happen to be far too abundant to be thoroughly appreciated. Last spring, it will be remembered, enormous quantities of tea were being taken out of bond to evade the payment of an extra duty, should it be imposed, and so disarranged was the customary order of business that it was several months after before the rate of delivery righted itself; but no such disorganisation of the home trade will be experienced this year. About Christmas-time and shortly afterwards there were some attempts to clear tea out of bond, but they did not assume any formidable shape, and since then the duty payments have been of not more than average amount. Thus, money in tea, which early in 1901 was practically locked up and useless, will now be liberated, and can be applied to the more legitimate purpose of buying and furthering the progress of the trade as well as protecting the interests of consumers as a body. By these means the tea market generally will be kept in a sounder and more healthy condition than it has been for two or three years past."—*H and C. Mail*, March 21.

TEA IN AMERICA.

New York, Feb. 19.

There has been a little more doing in an invoice way. Market firm and unchanged. The same standards have been adopted for next season as have been in use the past year.

IMPORTS OF TEA SINCE THE EXHIBITION YEAR.

Year ending June 30—	Net imports. Pounds.	Value. Dollars.	Av. import price, ℔ lb —Cents.	Per capita population. Pounds.
1893	88,131,088	13,651,800	16·0	1·32
1894	91 801,565	13,857,893	15.1	1·34
1895	96,457,042	13,029,868	13·5	1·38
1896	93,340 243	12,585,741	13·5	1·31
1897	112,907,548	14,737,062	13·1	1·55
1898	67,697,295	9,608,530	14·2	0·91
1899	72,834,816	9,523,313	13·1	0·96
1900	84,843,451	10,557,741	12·4	1·09
1901	89,084,947	10,862,455	12·2	1·17

—*American Grocer.*

CEYLON TEA IN 1901:

HIGHEST CROPS AND AVERAGES

According to the Annual Report of Messrs. Wilson, Smithett & Co. (which we are reproducing in this issue), the Diyagama Factory (New Dimbula Company) sent the largest quantity of tea to London last year—no less than 1,247,000 lb. realising the splendid all-round average of 9¼d per lb.; while Goatfell gave the highest actual average 1s 0½d for 100,000 lb. The other high returns were Sutton 11¼d for 108,500 lb.; Talawakelle's 10¼d for 467,000 lb.; Waverley 9¾d for 400,000 lb.; Concordia 10¼d for 215,000 lb.; Henfold 10¼d for 258,000 lb.; Lippakelle 9½d for 240,000 lb; Mount Vernon 9¾d for 248,500 lb.; Portmore 10½d for 241,000 lb.; Ragalla 9⅝d for 304,000 lb.; Diyanillakelle 10d for 129,000 lb.; Ferham, 10d for 121,000 lb.; Holmwood 10¼d for 120,000 lb; Nutbourne 9¾d for 80,000; Pitaratmalie 9⅞d for 139,000 lb; Thotulagalla 10¼d for 95,500 lb.

DO TROUT BREED IN CEYLON?

A correspondent writes to our contemporary that a companion with him at the Horton Plains on April 1st caught a rainbow trout 4 inches long, though the last trout fry (brown) were turned down by Mr. John Fraser in May 1901 and rainbow fry some time earlier, and wishes to know if it could have been born and bred on the Hortons. We enquired of Mr. Fraser his opinion this morning, and he informs us that he recently took out trout, varying from 3 to 20 inches in length, from his own stewpond, from fry put in 2 years ago; they had grown up irregularly and their ages could not at all accurately be told from the size. Mr. Fraser does not share the hope that our rivers may soon be "self-stocking."

THE TEA MARKETS EXPANSION COMMISSION.

(FROM THE SIXTH REPORT.)

We have received a copy of the sixth Report of Messrs Andrew Yule & Co., the Commissioners, to the members of the Advisory Committee, referring to the operations during January and February, 1902.

Tea contributions promised to 28th February, 1902. —Total 683,744 lb, the same as on the 31st December last. Acting on the suggestion of the Commissioners, cash has, in some cases, been given in lieu of tea, at the rate of 4 annas per lb. Up to 28th February, 1902, the following proportions of the promised contributions have been received:—

	lb.		RS.	AS.	P.
In tea about 47% =	323,987	valued	81,260	9	9
In cash do 3% =	21,760		5,510	0	0
Total 50% =	457,347		86,770	9	9

against 39 per cent received to 31st December last. The average value of the tea is 4 annas per lb, against 4 annas 1 pie to 31st December last. Cash subscriptions received to 28th February, 1902 amount to R9,010, against R1,210 received to 31st December last.

PURCHASE OF TEA.—To meet the demand for classes of tea other than those contributed, to 28th February, 1902, 26,358 lb of area were purchased at a cost of R8,974-7-11. The teas were all purchased at public auction. Tea stock on 28th February, 1902, is approximately as follows:—

Received into godowns from contributors 323,987 lb; Ditto by purchase 26,358 lb—Total 350,345 lb. Tea disposed of in the seven months 160,374. Tea in stock on 28th February, 1902 189,971, against 168,888 lb on 31st December last.

PICE PACKETS.—The demand for these continues satisfactory, the total issued to 28th February, 1902, being 526,015. The packets are sold in any part of India at one pice each as in Calcutta.

BREWED TEA.—The total number of cups brewed tea sold at one pice each, to 28th February, 1902, is 116,222. Cost of working to 28th February, 1902, is roughly R17,000 as against R10,000 to 31st December, 1901.

NEPAUL.—The Prime Minister and Marshall of Nepaul, in reply to a letter asking him to encourage the efforts of the commission in that Dominion, stated that, while he personally wished the movement every success, he feared not much could be done, as the Nepaul Government had long being unsuccessfully endeavouring to bring tea into general use with a view to tostering the tea plantations existing in the eastern part of their territory. A case of pice packets has, however, been sent to Nepaul as a trial.

OTHER AGENCIES.—Work through other channels and Agencies has been continued. The Dacca Agent reports that the Commission's tea has gained a firm footing in Dacca, which is the main supply station for the Districts of Dacca, Mymensing, Tipperah and Chittagong, and that in the more important towns of these he has established sub-agencies which are under the regular inspection of travellers, who also visit all Fairs within their reach. An Agent of the Commission has also made a tour through Kathiwar and Gujerat, visiting Porbandar, Junaghah, Rajkot, Bhavanagar, Wadwan Ahmedabad, Baroda, Surat, Karachi and Cutch, with a view to introducing the Commission's tea into these places. Another Agent has been actively convassing Jubbulpore, Agra, Delhi, Jhansi, Cawnpore, and Gwalior. Another Agent has visited several Fairs and Melas, and held demonstrations and sold tea at these gatherings.—*Madras Mail*, April 8.

CEYLON TEA IN 1901.

Extracts from Geo. White & Co.'s Annual India, Ceylon, and Java Tea Report.)

March, 1902.

We would preface our usual annual report by offering our congratulations to those interested in this important industry, especially the producer, on the partial dispersion of the heavy cloud which over-hung it when we compiled our review just a year ago. From various causes a marked reduction in the output of the chief growing countries has been apparent, and the trade would appear to be once again gradually emerging from a condition of repletion to one of comparatively healthy appetite. The all-absorbing question now is how to guard against a relapse into the lamentable state experienced during the season 1900-1, and in this connection we would draw attention to our remarks under "Prospects."

CEYLON.—The comparative shrinkage in the total crop gathered was less than in the case of India, but increased shipments from both Colombo and London to outside ports reduced the quantity available for the markets within the United Kingdom. Elsewhere we refer to the main question of supply and its effect on prices. In the case of Ceylon it may be noted that the average in February, 1901, was 6½d per lb, while in the October following it stood at 8d per lb. Quality, on the whole, was distinctly above the average, varying a little according to season, the most attractive reaching London, as is customary, about October. Owing to this usual variation, it may be here noted that seldom, if ever, is it possible to contrast sales made simultaneously in London and Colombo, the high probability being that these markets are not selling similar tea, be it better or worse, there having been nearly two months' difference in the time of manufacture. Really low-grade tea, so often met with twelve months since, has been conspicuous by its absence. As in India, the production of choice quality was on a limited scale, and ordinary fine kinds, having a better class below to compete with than usual, suffered to some extent. Useful to good Broken Pekoes have often been below par, the fact of the important

export trade being so far chiefly confined to leaf, having constantly favourably influenced the value of such, to the seeming detriment of brokens. This feature will doubtless become less prominent as outside markets learn to use the whole assortment.

STATISTICAL POSITION.—Shipments for the past year to the United Kingdom totalled 107 millions against 114½ in 1900, which, together with an increase in Deliveries in the 12 months of 2½ millions, resulted in a reduced stock of 5 millions at the opening of the present year, compared with 1st Jan., 1901. Generally speaking the immediate position under this heading is satisfactory, especially when it is noted that the imports during the 12 months ending 31st December last were actually some 5 million lbs less than the total deliveries for a like period. For the twelve months the following on Estate Account passed the hammer in London:—

1901.	1900.	1899.
1,059,800 pkgs.	1,125,100 pkgs.	1,000,000 pkgs.
* (Av. 7d ₩ lb.)	(Av. 7⅜d ₩ lb.)	(Av. 8d ₩ lb.)

* Includes the unprecedentedly low rates ruling last spring.

The Board of Trade returns for all Tea (which embraces every Bonded Warehouses in the U. K.) for the past three calendar years were:—

	Home Consumption.	Export.
1901	255,873,000 lb.	43,388,000 lb.
1900	249,792,000 „	*38,907,000 „
1899	242,561,000 „	32,223,000 „
	Total Deliveries.	Bonded Stock, Dec. 31.
1901	299,261,000 lb.	115,951,000 lb.
1900	288,699,000 „	†119,430,000 „
1899	274,784,000 „	113,010,000 „

* Excluding about 4½ million lb. of Brick Tea transhipped to Siberia. † Re-adjusted.

This denotes a further extension of over 6 million lb. in the use of the article at home. It is calculated that the consumption per head of the population of the United Kingdom, which was 4½ lb. in 1880 and 5 lb. in 1890, had risen to 6¼ lb. in 1901. Exports to the Continent, &c., from here, of British growth mark an expansion of about 7¼ million lb., not including "overside" transhipments, and compare with an increase to outside ports from Colombo of 5½ million lb. and a decrease from Calcutta of rather over 2 million lb.

PROSPECTS.—The producer has it largely in his power to make or mar, and we would urge upon all interested the high importance of remembering that only by a rigid adherence to the policy of keeping supplies within the limits of consumption, can be found any hope of preventing the already improved situation from again taking a retrograde movement. Finer and more careful plucking, combined with climatic influences, have been the factors at work, and together they have undoubtedly, at least for the time being, saved the situation. Let it be well understood, if growers are again placed in the position they occupied in Season 1900—1901, when they had to force a quantity out of all proportion to consuming possibilities down the throats of the trade, they will assuredly once again feel the inevitable result of transgressing the laws of supply and demand. The heavy extensions carried out about the middle of the last decade are only just coming into full maturity, and under normal weather the approaching crop may easily get out of hand in respect to quantity. In spite of all warnings and the experience that the contrary usually happens, the feature of any one season as regards an enhanced price obtaining for any particular grade has almost invariably been reflected in the production of the following one. Looking then at the comparatively high level on which common descriptions have stood during most of the past season, there is an element here of further danger. Under similar circumstances have we not heard the grower, who can produce "stand-out" quality, perhaps not unnaturally, exclaim that he will make no more fine tea, so-and-so having got within a trifle of his average and made many maunds more per acre. And thus the seeds are sown for an enormously augmented crop *of an inferior article.*

It was on this basis, after the *unfortunate*—we use the word advisedly—abnormally high price for common tea season 1899-1900 closed with, that the unwieldy crop of 1900-1901 was gathered, the disastrous results of which should still be green in memory. It is manifest that conspicuous success in curtailing the out-turn must to an appreciable extent follow a climatic condition of slow growth, and in the possible absence of this most necessary factor, in order to lessen the element of chance as regards such, all the greater care will be called for in the direction of restricting output. The mere regulation of plucking, only a given number of leaves and a bud in any unusually free flushing period will scarcely suffice; in the latter event it may at times be essential, even at the expense of cultivation, to put a larger share of the labour force to gather leaf and so get round the garden at shorter intervals. It is obvious that the longer the leaf is allowed to "run," in like ratio will the income of green leaf be increased in bulk and weight and decreased in quality.

In our foregoing remarks we have included the question of supply, as it is inseparably bound up with "prospects" and in it lies the whole crux of the matter. If it can be more widely realised that in the ability to show an increased out-turn in the weekly returns from Gardens does not alone lie salvation, the future welfare of the Trade will become more assured In this connection we would draw attention to a most significant letter under the heading "Japan Tea," which appeared in the *Home and Colonial Mail* of the 7th instant, and which is of pregnant interest when applied to India and Ceylon. The writer proves by published statistics that from their maximum point in 1891, the exports from that country had fallen in 1900 to the extent of 20 per cent., while the valuation of the reduced quantity had risen by fully 30 per cent. He summarises the position thus:—"The moral is a plain one. If India and Ceylon can keep down their quantities, improve their qualities, and gain an increased 30 per cent. on the selling values, the crisis in tea production will soon be a memory only." To grapple successfully with disease you must strike at the root, and it needs no special knowledge to diagnose the source of the trouble our trade has been suffering from. The regulating of sales, &c., may at times afford relief, but we must go further to find a permanent cure. Speaking generally, no disturbing feature mars the outlook if only the market is not overfed. The use of tea is becoming more and more common throughout the civilized world, and some compensation may here be found for the low prices which have accompanied excessive supplies, and no doubt aided the opening of new markets. The grower has however sown freely to his cost,

let him now pay attention to the reaping. To judge from Ceylon figures the determination to limit quantity is being well sustained. India should in the coming season see that she also follows a like policy. As regards the producing of Green Tea for America and Canada there has not yet been anything like a sufficient supply to test the possibilities of these markets. The measure of success attained should however encourage perseverance, but large shipments should be forthcoming, even if disposed of at an initial loss, to ensure a tangible result. An energetic effort is being made in India to encourage tea drinking amongst the native population. With such an enormous field to work on there is good hope of a fruitful return on the expenditure in money and kind now being incurred in the exploitation of the different Presidencies.

MANUFACTURE.—The line we would advocate may be gathered from the foregoing remarks. Owners, especially in Assam, may feel tempted to go for quantity in view of the prices other districts, more notable for such, have realised. May we remind them of the result of adopting this course in 1900? If an equally good crop as the last one from the Dooars, Cachar and Sylhet could be guaranteed, the matter might be different. At times shipments have included some proportion of dry, almost "bakey", liquoring kinds, a baneful characteristic not infrequently imparted in the final operation of firing.

PACKING.—Slack-packed chests, bearing no sign of leakage, not infrequently come to our notice, and as they usually incur an allowance of ½d per lb., are to be guarded against. This is not claimed on the basis of irregularity of weight, but because the package is not full and consequently liable to travel badly. To the blender a slack packed chest can make no difference, but he seldom forgets to claim.

SIZE OF BREAKS.—Remains as before, viz.:—India, 20 chests, 30 half-chests, 50 boxes. Ceylon, 18 chests, 24 half-chests, 40 boxes. Anything under these is a small break and is to be avoided as much as possible. Ceylon still sends a rather large proportion; this might often be advantageously reduced by fewer grades being assorted. There is practically no object in packing in boxes; they cost the garden more in every way, including freight, handling, &c., and seldom give a corresponding benefit in price. This also applies to half-chests, the demand for which is more limited than formerly, and except in cases where the lighter package is necessary, owing to difficulties of local transport, there appears to be no advantage in using anything but the ordinary full sized chest for the usual run of tea.

	Total Ceylon.
	lb. average.
1901-1902 ..	748,900—7¼
1900-1901 ..	861,500—7
1899-1900 ..	802,400—7¾

COTTON IN GERMAN EAST AFRICA.

BERLIN, March 24.—A conference of experts and persons interested in the cultivation and sale of cotton met today in the Colonial Department of the German Foreign Office, under the presidency of Dr. Stuebel, head of the Department. The following resolutions were passed unanimously: (1) That the conference notes with interest the report on the satisfactory results obtained by the cotton expedition of the Colonial Economic Committee to Togo, and expresses its thanks to the Committee. (2) Provided that the necessary funds are granted by the parties interested and by the Government, a commission of agricultural experts is to be dispatched, under the auspices of the Colonial Economic Committee, to the United States, with the object of studying the cultivation of cotton in that country. The result of their investigations is to be turned to account by the establishment of experimental stations for the purpose of introducing in German East Africa the cultivation of cotton as a native industry.—*H and C Mail,* March 28.

JAPAN AND THE MALARIAL MOSQUITO.

Tokio, March 19.—Extensive experiments, which have been conducted by the military authorities in Formosa for the purpose of determining the influence of mosquito in propagating malaria, show remarkable results. A battalion of soldiers completely protected against mosquitos during the malarial season for 161 days, escaped the disease entirely, whereas an unprotected battalion in the same place during the same time had 259 cases.—London *Times*, March 25.

PLANTING NOTES.

STRAITS EXPERIMENTAL PLANTATIONS.—Mr. Stanley Arden would seem to have made a fair beginning with his important work at the Straits, to judge by the extracts given from his Report in our daily and *T. A.* It was hampered at first by the want of a suitable site; but Mr. Bailey's Selangor Rubber Syndicate came to the rescue, with an offer of 200 acres on certain terms, and these are likely to be agreed to.

CEYLON v. JAPANESE GREEN TEA.—The important information we publish elsewhere tonight marks a stage in the history of the production of green tea in Ceylon. The Ceylon article has been hitherto largely preserved from the methods of manufacture in vogue further east, but it remains to be seen whether, if the market held by Japanese greens in Canada is to be properly captured by us, the article from our colony is not to approximate more closely to the Japan product than it does at present. In the new green tea factory in Colombo ample provision is made for this contingency.

THE NEEM OR MARGOSA.—The Planter who sent us the extract on the medicinal uses of the Neem from an Indian paper writes:—"I am much obliged to you for the interesting information bearing on the identity of the Indian Neem with the local Margosa. My ignorance has led to the publication of information which, I am sure, will be welcomed by a great many of your readers. I made the acquaintance of the Margosa tree on a visit to the North many years ago, and I know the natives believe in the bark as a febrifuge. The oil is one which commends itself specially to Tamil olfactories as I have reason to know as an employer of Tamil labour; but I think I would prefer the rheumatics to the smell of the oil! *Non tali auxilio.*"

TO THE PLANTING WORLD.

Seeds & Plants of Commercial Products.

Hevea Brasiliensis.—Orders being booked for the coming crop August-September delivery 1902, booking necessary before the end of April, quantities of 100,000 and over at special low rates. Plants available all the year round, 100,000 and over at special low rates. A leading Rubber planter in Sumatra, who purchased 50,000 seeds in 1899, and 100,000 in 1900, writes us, under date 15th November, 1900 :—"I received your letter of 20th October, from which I learn that you added another case of 5,000 seeds to replace the loss, &c. I am satisfied hereby, and even after this adding I am satisfied by the whole delivery of this year." Special offer, post free on application.

Castilloa Elastica.—True superior variety cultivated in Mexico, seeds from specially reserved old untapped trees. Orders booked for August-September delivery 1902, immediate booking necessary; large quantities on special terms; Plants in Wardian cases.

A foreign firm of Planters writes under date 11th October, 1901 :—" We beg to enquire whether you would procure us 100,000 Castilloa seeds, in which month we might expect them, and what would be the average price." Special offer, post free on application.

Manihot Glaziovii.—Seeds and Plants available all the year round, 100,000 and over at special low rates. A Mexican planter in sending an order for this seed wrote on the 22nd August, 1900 :—" If they arrive fresh and germinate easily I may send you larger orders, as they are for high ground where the Castilloa does not thrive."

Ficus Elastica.—Seeds available in May-June; booking necessary before the end of March; also plants.

Mimusops Globosa (Balata) wood of the tree is much sought for buildings, fruits sweet like a plum and eaten, oil from seeds, said to yield as much as 45 lbs. of dry rubber per tree per annum, the milk is drunk and when diluted with water used as cow's milk, grow from sea level up to 2,000 feet, orders being booked for seeds and plants, price on application.

Cinnamomum Zeylanicum (Cinnamon superior variety).—New crop of seed in April to June; booking necessary before the end of February; also plants.

Coffee Arabica, Liberian Hybrid and **Maragogopie Hybrid.**—New crop March-April; immediate booking necessary.

A foreign Agricultural Department writes dating 9th September, 1901 :—"Please accept our order for 175 lbs. of Tea seed and for 2,000 Coffee beans. In regard to Coffee seed I would say that this will be the first importation made by this department, and we will leave the selection of the varieties to be sent to your judgment."

OUR DESCRIPTIVE PRICE LISTS.

The following six Descriptive Price Lists are now being forwarded with Circulars and special offer of Seeds and Plants of Rubber and other Economic Products :—

1. Tropical Seeds and Plants of Commercial Products, enlarged edition for 1902.
2. Seeds and Plants of Shade, Timber, Wind-Belts, Fuel, and Ornamental Trees, Trees for Roadsides, Parks, Open Spaces, Pasture Lands, Avenues, Hedges, and for planting among crops (Tea, Coffee Cacao, Cardamoms, &c.)
3. Seeds and Plants of Tropical Fruit Trees including Mango grafts.
4. Bulbs, Tubers and Yams.
5. Orchids—Ceylon and Indian.
6. Seeds and Plants of Palms, Calamus, Pandanus, Cycads, Tree and other Ferns, Crotons, Roses, Dracinas, Shrubs and Creepers.

Special Arrangements made with foreign Governments, Botanical and Agricultural Departments, Planters and others for supplying seeds and plants of Commercial Products in large quantities.

"South Africa."—The great authority on South African affairs of 25th March, 1899, says :— "An interesting Catalogue reaches us from the East. It is issued by William Brothers, Tropical Seed Merchants of Henaratgoda, Ceylon, and schedules all the useful and beautiful plants which will thrive in tropical and semi-tropical regions. We fancy Messrs. Williams should do good business, for now that the great Powers have grabbed all the waste places of the earth, they must turn to and prove that they were worth the grabbling. We recommend the great Powers and Concessionaries under them to go to William Brothers."

Agents in London :—Messrs. P. W. WOOLLEY & Co., 90, Lower Thames Street.

Agent in Colombo, Ceylon :—E. B. CREASY, Esq.

Agent in British Central Africa :—T. H. LLOYD, Esq., Blantyre.

Telegraphic Address:
William, Henaratgoda, Ceylon.
Liber's, A.I. and A.B.C. Codes used.

J. P WILLIAM & BROTHERS,
Tropical Seed Merchants,
Henaratgoda, Ceylon.

Correspondence.

To the Editor.

ERADICATION OF THE PRICKLY PEAR IN AUSTRALIA.

6th March 1902.

SIR,—In the *Tropical Agriculturist* of January 1902. p. 472 this occurs. "The Government (Brisbane Nov. 27) today decided to offer a reward of £5,000 for the discovery of a method of eradicating the prickly pear," &c., (Adelaide *Observer*) Before eradicating the prickly pear tree, would it not be a wise plan to see whether some use cannot be found for it. But first it might perhaps be useful to try and decide what a "prickly pear" is. There are prickly pear trees (Opuntia) in South Africa, in Australia and in South India. Are these three one and the same species, or are they all three different? The name of "Prickly Pear" is very misleading. In the Mediterranean there is a fine species which produces delicious fruit in summer. It is of three different varieties, the red, the white and the yellow fruited. Under cultivation it produces fine fruit and grows into a large bush. In the Mediterranean it is called *Fico d' India*, and presumably it is the "Opuntia Ficus Indica." But in England I found it anything but hardy. So recently I obtained two species from the Cambridge Botanic Garden which are there declared to be perfectly hardy although their fruit is of no value. One is *opuntia bicolor*, and other *O. Engelmanni.* My object in getting these, is to try and graft the tender *O. Ficus Indica* on to these hardy ones; and experiment with them again in the open. The appellation of 'Prickly Pear' is of no use, as all kinds, good, bad and indifferent, are, it seems, called by that name.

Now, could not the Government of Australia import the fine and luscious varieties of the *O. Ficus Indica* from the Mediterranean—they are grown in Cyprus, Malta, Sicily and other places—and see if they cannot be grafted on the Australian Opuntia? That might perhaps be one way of utilizing some at least of the acres of wild prickly pear. It should also make useful hedges.

But there may possibly be another and more sensible way of utilizing this flat-branched tree. In the Mediterranean I have seen people feeding goats with the flat branches of the "Fico d' India," cut in pieces, and also with the fruit skins. The goats did not seem to mind the prickles in the least. The sheep has been largely patronised in Australia, but I have never heard that the goat has been cared for there.

Yet the goat is one of the most useful animals, both for its milk and its flesh. Kid is highly prized as a meat. Then its skin is also valuable. One should see the milk men in the south of Europe—in Leghorn, Naples, Sicily, Hyères, &c.,—going from door to door, with a small herd of goats and milking them as the people wanted the milk. It would be an interesting experiment if somebody in Australia would try to feed goats on this prickly pear. The way to commence would be to take a young green branch, scrape off the prickles, cut it in pieces, and force a bit into the goat's mouth to enable it to get a *taste* of it. If it is hungry, the chances are it will eat it, and continue to do so afterwards.

E. BONAVIA, M.D.

COCONUT PLANTING: TREES PER ACRE AND NUTS PER TREE.

London, March 7.

DEAR SIR,—In your *Overland Observer* there are letters from H. L. D., dated 31st January and 3rd February, with reference to Kirimetiana Coconut estate, which are not without interest.

From the figures he gives it would appear that last year the estate of 603 acres gave 838,970 nuts or 1,391 nuts per acre. He also states the yield per tree was 44·5 nuts, so it follows there are only 31 trees per acre.

As I understand, Coconuts run on an average 80 trees to the acre: so it would appear (unless the 603 acres have an enormous number of vacancies) that only some 40 per cent of the trees, which are said to be from 10 to 30 years old, are in bearing. Perhaps H. L. D. would kindly publish some figures in elucidation?

COPRA.

[An explanation is certainly needed; for the 603 acres are described as "fully planted," and if all the trees are not in bearing—as we suppose must be the case—it was a mistake to average the total crop without specifying how many acres, or trees, were in full and how many in partial bearing?—ED. *T.A.*]

ALKALINE PHOSPHATIC MANURES.

London, E. C. March 21.

SIR,—In reference to my lecture last week at the Society of Arts the enclosed cutting from the *Standard* of the 20th March shows that the new manure is favourably regarded.—Yours truly,

JOHN HUGHES.

(Cutting.)

An interesting discussion on "The Utility of Alkaline Phosphatic Manures" took place at a meeting of the Society of Arts last week, introduced by Mr. John Hughes, F. I. C. The lecturer described the several phosphatic manures, and stated their respective degrees of solubility in cold water, or in an extremely weak solution of citric acid—much weaker than the acidity in the juice of the roots of plants, or in soils that are not alkaline. The comparisons showed that the new manure, basic superphosphate, is much more soluble than basic slag in cold water, or in a citric acid solution, and that its proportions of available lime and phosphoric acid are very much greater. Ordinary superphosphate is still more soluble in cold water, and for alkaline soils it is to be preferred to the new manure; but for acid soils the latter can hardly fail to give the better results. The several chemical authorities who took part in the discussion almost unanimously expressed the opinion that basic superphosphate would prove a great acquisition to farmers.

PALAI, OR PALU, WOOD.

Hanwella, March 26.

DEAR SIR,—Referring to Mr. Armitage's letter *re* sawing rate paid for Palai (Tamil, Sinhalese Palu) wood in your paper of the 22nd instant, may I inform you that it is a very tough wood, not inferior to ironwood (Na). A cubic foot of Palu wood is said to weigh 68 lb.; hence it is only used for heavy work, such as bridge construction and for posts in house building. The sawing rates differ according to circumstances and localities. The rates generally paid in the Western Province, for all kinds of hard wood, such as Dunumadala, Galsiyambala, Na, Palu, Munamal, Mee, etc. are between

rupees eight and ten. None of these are used for cabinet purposes except for curiosity, as they are too heavy and apt to crack, being close-grained.—I am, yours faithfully,

A NATIVE.

CEYLON RUBBER.

Kandy, March 27.

SIR,—As of general interest I herein enclose extract from a copy of Messrs. Kramrisch and Company's annual review of the rubber market for the year 1901, received by Government from the Secretary of State for the Colonies.—I am, sir, yours faithfully,

A. PHILIP,
Secretary, P. A.

EXTRACT FROM MESSRS. KRAMRISCH AND COMPANY'S ANNUAL REVIEW OF THE RUBBER MARKET FOR THE YEAR 1901.

"Imports from Ceylon were again insignificant, but whatever small quantity reached this market proved very attractive, as the quality and condition continued to be excellent and many buyers were anxious to secure even the small arrivals, owing to the specially clean condition of this rubber. We confidently expect that, if larger imports could be arranged, a great circle of consumers would come in and pay full prices for these grades, especially if the quality be kept up. It would be advisable to encourage the planters and others interested in this product in giving particular attention to this most valuable rubber. High prices were realised and 3s 9¾d was recently paid for fine and 2s 4d for the Negroheads. It is, of course, known that this rubber should practically be of the same kind as the one coming from the State of Amazonas, being grown from para seed."

KIRIMETIANA COCOUNTS.

Colombo, April 4th.

DEAR SIR,—Replying to a letter signed "Copra", under date London, March 7, *re* Kirimetiana coconut estate, appearing in your issue of 29th ult.- the largest number of trees yet picked from, at any one crop, is 18,380. This includes young trees in bearing with trunks of 4′ to 8′, of which there are not less than 3,000 to 4,000 on the younger plantations, and amongst the supplies—so that the average from sections of fully matured trees is much larger. Most of the estate is planted 30′ apart, which gives 50 trees to the acre, but some small portion is irregularly planted. There are no vacancies. —Yours faithfully, H. L. D.

[The number of acres being 603, we gather from the above that only about 30 out of 50 trees per acre were picked from at any one crop? It is surely most unusual to plant coco palms 30 feet apart? We had thought few plantations had less than 70 trees to the acre.—ED. *T.A.*]

CEYLON TEA IN AMERICA.

Kandy, April 7.

SIR,—The accompanying newspaper extracts, received from Mr Wm. Mackenzie, are of considerable interest at present in reference to Ceylon Tea in America and are placed at your disposal accordingly.—Yours faithfully, A. PHILIP.

Tea merchants say the action of the Ways and Means Committee in retaining tea on the tariff list for another year is outrageous. "The plea that the country is so well stocked with tea that it will take at least a year to work it all off upon the market," declares G T Matthews, a leading New York importer, "is ridiculous. Every one who knows anything about the business is aware that there has not been for many years such a small stock of tea in the country, for the reason that the importers for several months have been expecting that Congress would remove the duty." The Committee made a mistake in discriminating against tea. It is the one commodity that should have been relieved from the tariff burden the first thing. The people have to pay the increased expense.

The market for Indian and Ceylon teas is rather easy. Japan teas are fairly firm. There is still quite a scarcity on the spot in Ceylon greens, and there have been quite a number of inquiries. Owing to the scarcity, however, the inquiry is not as pronounced as it was. The price of Ceylon greens is at least 1c, higher than it was a month ago. There have been a few transactions here in China green teas during the past week, but there is still a pronounced scarcity, although at the price now ruling not many transactions are to be expected.

Worcester, Mass, is taking to the soft drink habit, and the softest drink and the most popular is tea. Dealers say the sale of tea is greater than for years, and in every line connected with drinking and serving tea there is a boom, Tea has become fashionable once more, and that is the reason for its popularity. It is almost a truism to say that fashions move in circles, that, like history, they repeat themselves. The latest turn of the wheel has brought the tea table into vogue, and prospects point to a long reign of the fad. Many housewives have ransacked the garrets and brought out the old tea table, which now stands in an honored place in the drawingroom. The hostess who fails to offer her guests a cup of tea is far from being the real thing, and since the revival of the custom the graceful art of presiding over a tea table is being practiced in many homes. Where Dame Fashion sets the pace all must follow. Physicians try to discourage the practice of tea drinking, claiming that much tea is poison to the system and that digestion suffers in proportion to the amount of the herb consumed. To this the fashionables are returning that the quiet and rest of a short half hour spent over the tea cups late in the afternoon more than

MAKES UP FOR THE DAMAGE

to the system, and that tea properly prepared is not half so harmful as medical men try to make out. In addition to this, they say they are to drink tea as often and as freely as they wish. When fashion and the doctors clash, one party has to go to the wall, and it is not generally fashion. So the tea table and accessories have come back to stay awhile. The woman who owns one of the real old-fashioned Japanese lacquer tea caddies is a queen among her set. The older the better, only it must hold plenty of tea and be air-tight. With the advent of the revived fashion comes a scientific knowledge of properties and constituents of tea and the

fashionables are severe critics of its quality. Instead of discussing the servant girl problem the women talk learnedly of various blends, taking as much interest in the arguments as old club men over the virtues of a certain whisky. They can tell to a dot just how much green tea should be mixed with black breakfast tea to produce the desired aroma, and Oolong, Aden and Ceylon are becoming bones of contention as much as women's rights and universal suffrage. Rare old china that has been used for decorative purposes is now being

PUT TO A PRACTICAL USE

in the household. It is correct thing to be able to show a varied assortment of Sevres Chini, and all the other kinds of China, that collectors and amateurs affect. The hall marks of the real articles are being looked up, and if the guest turns up a cup when the lady of the house is not looking, it is to see whether the proper stamps is on the China. Imitations don't go, and the unfortunate one discovered in an attempt to palm off inferior ware is made the topic of the next session from which she is absent. It is not at all the correct thing to show a complete set of any one pattern of varied shapes and sizes are desired, the more varied the better. Old-fashioned brass tea kettle are also in great demand. Many a woman who cast the old kettle aside as being useless, bitterly repeats her folly, for the dented and battered old brass is infinitely better style than the newest and most artistic patterns from the shops. Those who have kept their old friends are working up a muscle by polishing their sides to a mirror-like gloss. Useful members of the family who are able to embroider are at work on huge tea cosies for the corner table, and these are being modelled as close to old-fashioned lines as possible. In their construction, old pieces of brocade, fragments of old gowns of fancy silks and satins are utilised and take precedence

OVER NEWER FASHIONS.

The new fad must be in ancient guise to realise its greatest height. The fashion was introduced by one of the fashionable set, who issued invitations to what she called a kettledrum tea. This was really an old-fashioned 5 o'clock tea under an older name. There was some doubt in her mind as to the success of her venture, but to her great satisfaction the kettledrum "went" with a rush. The honored ones were charmed with the arrangements and made mental plans for a repetition of the function at early dates. Since then 5 o'clocks have been the rage, and in the church-going set, where worldly pleasure, is at present set aside, the tea table has provided a relaxation in place of the gayer meetings of a month ago. There are a hundred and one ways of making tea and each has its devotees, Russian tea, German tea, French tea and plain tea are served, and each manner of service finds some one to appreciate it. The old way of taking tea, which has been out of style among fashionable folks for years, is back again, and cream and sugar pitchers and bowls are enthroned. Tea with lemon has not been altogether displaced, but its grip is weakening. Russian tea, a mixture of tea, lemon and Jamaica rum, is one of the really new ideas, and what few

MEN FIND THEIR WAY

to the teas have taken to it with suspicious readiness. If they are allowed to measure out their own proportions they can be persuaded to drink several cups. Houses where Russian tea is served get more men than others, and American men are coming to the belief that the Russians are better fellows than they formerly imagined. The suspicious breath can be easily explained by saying that the owner had just come from Mrs W's afternoon tea. An excuse is sometimes needed in such cases, and by general consent a poor excuse is better than none. There is one essential to a successful tea, no matter in what way the beverage is ultimately served. The tea must be properly prepared in the first place. As well mix a cocktail without bitters as tea without fresh liquor to start with. The accepted mode of making tea is to take fresh cold water and fresh tea. The water is brought to a boil, and while this is going on the maker rinses the tea pot with boiling water, and puts in one big spoonful of dry tea to each cup required. When the water

REACHES THE BOILING POINT

it is poured into the tea pot, allowed to stand four minutes and then is ready to serve. Water that has been boiled and allowed to stand is not good. It must be fresh originally and allowed to come to the boiling point and no further. The recipe is simple, and by following it the best results are obtained. Tea is always prepared within sight of the guests, and for this reason a complete alcohol outfit is required. Instead of having the hot water brought from the kitchen, it is boiled on the tea table, and the transfer from boiler to tea pot is immediate. If a fresh supply of tea is wanted, the process must be repeated entirely. Fresh leaves are never added to those already used, for if the leaves are allowed to stand over five minutes they give out too much tannic acid, which is the hurtful ingredient in their make-up. American women are reverting to the old form of simpler food to accompany tea. The best thing to offer is bread and butter, sliced thin, or a simple sandwich. Afternoon parties had degenerated into a sort of free lunch, where the resources of the hostess were drawn on largely for novelties. This is to be done away with, and the women are heaving a sigh of relief over the reaction.

THE NEEM TREE.

Colombo, April 16.

SIR,—As some of your readers seem interested in the neem tree, called by the Portuguese "Margosa," they may like to know that in India it is reverenced not only for its medicinal qualities but by reason of its sacred character. It is to the Sivaites very much what the bô-tree is to the Buddhists. Twigs of it are generally found in their houses, they like camping in its shade and the delicate blossoms are often seen both at their weddings and funeral ceremonies. Owing probably to its slightly disinfectant properties they also use it largely for the manufacture of the "scrubbing sticks" employed by natives as tooth brushes.—I am, yours truly, HILTON MERVYN.

THE WALAWE ESTATE COMPANY, LIMITED.

REPORT OF THE DIRECTORS.

DIRECTORS:—Messrs. Edward Elliott, and Edward Rosling.

The Directors herewith submit their Report and Balance Sheet for the year ending 30th September, 1901.

The Working Account,, inclusive of R250 deficiency from season ending 30th September, 1900, shows a loss of R2,626·82; and with the liabilities for interest, &c., and cumulative dividend on Preference Shares, it is increased to R4,824·40.

ACREAGE, &c.—The whole acreage of the Estate is 865 acres, of which about 550 have been aswedumised; out of this the area cultivated in the year was 1,054 bushels (twice over), or about 527 acres. An extent of 100 acres has been added since the Estate was taken over by the Company, and more would have been done but for the want of cattle, which are becoming very scarce in view of the extension of cultivation in the neighbourhood.

CROPS, &c.—The Estate share was 5,162 bushels paddy, which realised R7,125 02; and there was a profit of R571·96 on the purchase of seed paddy, making a gross income of R7,696·98 as against R8,419·31 in the previous year. The decrease was due to poor Maha crop. The Yalla was a fair one, and the Directors are glad to say the Maha now being taken is exceedingly good, and the Estate share is likely to realise R4,500 though the area cultivated was about 50 acres less owing to the sufficient supply of buffaloes.

The Provisional Directors, Messrs. Edward Elliott and Edward Rosling, in terms of the Articles of Association, retire from the Board.

The appointment of an Auditor for season 1901 02 rests with the meeting.

EMPIRE TEA COMPANY, LIMITED.

Registered February 26th, with a capital of £50,000 in £1 shares. Object: to plant, manufacture, and deal in any way with tea, coffee, cocoa, and other Eastern and Colonial products; as brokers, importers, commission agents, wherehousemen, and wharfingers; to erect machinery, factories, warehouses, &c. The signatories are:—

	Shares.
E G Le Butt, 10, Ashmount-road, Totenham, N.E.	1
G A Pollard, Ivanhoe, Anerley-road, Westcliffe-on-Sea	1
A Bates, 55, Dunsmure-road, Tamford-hill, N.	1
W L Simpson, 93, Station-road, Church-end, Finchley	1
G Mitchell, 41, Ockenden-road, Islington, N.	1
J B Stewart, 4, Fenchurch-buildings, E.C.	1
C W Latham, Oleander Villa, Birkbeck-road, Beckenham.	1
F Van Allen, Kandy House, Westcliffe-on-Sea	1
A Egger,, 65, Chardmore-road, Upper Clapton, N.E....	1

No initial public issue. The first directors (to be not less than three nor more than five) are to be elected by the subscribers. Qualification, one share. Remuneration to be fixed by the Company.

TALAWAKELE ESTATES COMPANY, LIMITED.

REPORT

to be presented at the fourth ordinary annual general meeting of the Company, to be held at the office of the Company, on Thursday, the 27th March, 1902, at 12 o'clock noon.

The Directors have the pleasure to submit the Balance Sheet and Accounts of the Company for the year ending 31st December, 1901, duly audited.

The Mortgage has been reduced to £15,500, by payment of the fourth instalment of £1,500 on 31st December, last, which has been charged aga the profit of the year.

The yield of tea and cost of production were almost the same as in previous years a d the gross average price obtained for the te sold in London, though a penny less than that r orded last year, was very similar to that obtained 1 198 and 1899, and may be considered satisfacto y.

The expenditure on new clearings, about £325 is charged against Revenue.

STATEMENT SHEWING RESULTS OF WORKING FOR THE FOUR YEARS ENDING 31ST MARCH, 1901.

Season	Acreage Plucked	Total Tea Crop.	Yield per Acre.	Sold in London.	Gross Average ₩ lb. Tea sold in London.	Cost of Crop ₩ lb. f.o.b. Colombo	Average Rate of Exchange per Rupee.	
	Acres.	lb.	lb.	lb.	d.	cents.	s.	d.
1898	802	421,284	525	418,565	10·57	27½	1	4 3-16
1899	802	419,544	523	417,164	10·23	27	1	4 5-16
1900	802	419,632	523	417,978	11·21	27½	1	4 [illegible]
1901	802	422,038	526	420,599	10·23	27½	[illegible]	[illegible]-16

The net profit for the year amounted to ..	£7,066 13 6	
To which has to be added interest ..	68 9 1	
And the balance from last year of ...	413 6 8	
		£7,548 9 3
Interest on the mortgage for the year has been paid, amounting to ...	£850 0 0	
The fourth instalment of the mortgage of £21,500 has been paid, viz ..	1,500 0 0	
Dividend on the 6 per cent Preference Shares for the year, *less* Income Tax, has been paid ...	311 8 9	
An Interim Dividend of 5 per cent, free of Income Tax, on the ordinary shares was paid on the 1st October ..	1,853 10 0	
Income Tax ..	376 15 0	
IT IS PROPOSED—		
To pay a final dividend of 6 per cent on the ordinary shares, free of Income Tax, making 11 per cent for the year, which will require ..	2,224 4 0	
And to carry forward the balance of ...	432 11 6	
		£7,548 9 3

The Directors desire to place on record their appreciation of the efficient management of the Estates by their Superintendent and his staff.

The Director retiring on this occasion is Mr Charles Murray Robertson, and he being eligible offers himself for re-election.

Mr John Smith, the Auditor, also retires and offers himself for re-election.—By Order of the Board,

ROBERTSON, BOIS & Co. *Agents and Secretaries.*

12, Fenchurch St., London, E.C., March 19, 1902.

SCHEDULE OF THE COMPANY'S ESTATES.

Estates.	Tea in bearing.	Tea not in bearing.	Forest and Timber.	Grass, Land, Buildings, &c.	Approximate Total.
Talawakelle...	(*a*) 302	38	(*b*) 43	(*c*) 22	405 acres.
Nanuoya ...	250	—	3	9	262 ,,
Katookella ...	250	30	—	8	286 ,,
Totals ...	802	68	46	39	955 acres.

(*a*) 3 acres leased from the Proprietors of the Boutiques.
(*b*) 36 acres felled for planting with Tea in 1902.
(*c*) 2 acres leased to Messrs. Davidson & Brown.

PORTMORE TEA COMPANY OF CEYLON, LIMITED.

REPORT OF THE DIRECTORS

to be submitted at the Fifth Annual Ordinary General Meeting of Shareholders, to be held at 24, Rood Lane, London, E.C., on Wednesday, 26th March, 1902.

The Directors have the pleasure to submit the general balance sheet and profit and loss account for the year ending 31st December, 1901, duly audited. The net amount at credit of profit and loss, after providing for general expenses, income tax, &c., is £4,375 11s 0d, to which should be added balance brought forward from last year, £684 14s 11d, equal £5,060 5s 11d. An interim dividend of 5 per cent. was paid, August 20th, 1901, amounting to, £2,000 0s 0d. It is proposed to pay a final dividend of 7 per cent. (making 12 per cent. in all, free of income tax) which will absorb £2,800 0s 0d, and to carry forward to next year £260 5s 11d equal £5,060 5s 11d.

In presenting their fifth annual report, the Directors have pleasure in recommending a dividend of 12 per cent. for the year ending December 31st, 1901.

The tea crop from the estates has been 226,282 lb., being at the rate of 486 lb. per acre, against 353 lb. per acre last season, the falling-off in quantity being partly accounted for by a certain acreage having been left unplucked during the latter part of the year, in accordance with the scheme for the reduction of output which it is proposed to continue.

The cost of production has been £4,314 19s 4d, being at the rate of 4·57d per pound, and the crop has netted £9,167 4s 6d, being 9·72d per pound.

The average price of Ceylon tea sold in London in 1900 was 7·20d, and the Portmore gross average was 10·47d, and while the average price of Ceylon tea for 1901 fell to 6·86d, the Portmore average rose to 10·66d, proving that the quality has been fully maintained,

The average rate of exchange has been 1s 4·32ds, against 1s 4 9·64ths, last year.

Mr L M Torin retires from the Board by rotation, and being eligible, offers himself for re-election.

The latest reports from the manager in Ceylon shews that estates, buildings and machinery are in good order, and the estates of crop and expenditure give promise of continued good results.

The Directors feel that great credit is due to Mr R C Grant, the manager, and Mr H A Grigg, the superintendent in Ceylon, for the way in which they have cultivated the estates and maintained the high quality of the tea during the past year.

THE CRAIGHEAD TEA COMPANY, LIMITED.

REPORT

to be presented at the fourth ordinary annual general meeting of the Craighead Tea Company, Limited, to be held at the offices of the Company, 12, Fenchurch Street, London, E.C., on Thursday, the 27th March, 1902, at 2-30 p.m.

The Directors have the pleasure to submit the balance sheet and accounts of the Company for the year ending 31st December, 1901, duly audited.

The mortgage was reduced to £3,150 by the payment of the third instalment of £450 on the 31st December last. This sum is debited to profit and loss account, and is an ample charge for depreciation.

During the year 32 more acres of land have been purchased, the cost of which has been added to capital account.

The total yield, excluding some 20,000 lb, made from purchased leaf, was 481,265 lb. tea, and the gross average price obtained in London was 6 67d per lb. Last year the crop was 395,105 lb. tea, and the gross average was 6·85d per lb.

	£ s. d.	£ s. d.
The Net Profit for the year amounted to ..	3,034 9 0	
And the Balance from last year to ..	670 4 6	
		3,704 13 6
Interest on the Mortgage has been paid ...	180 0 0	
The Third Instalment of the Mortgage (£4,500) has been paid ...	450 0 0	
Dividend on the six per cent. Preference Shares for the year has been paid ...	481 16 0	
An Interim Dividend of 3 per cent. on the Ordinary Shares, free of Income Tax, has been paid ..	687 6 0	
Income Tax ..	89 10 5	
It is proposed—		
To pay a final Dividend of 5 per cent. free of Income Tax, on the Ordinary Shares, which will require ..	1,145 10 0	
And to carry forward the Balance of ..	670 11 1	
		£3,704 13 6

The Directors desire to place on record their appreciation of the efficient management of the estates by Mr. Ernest Bertie Hay and his staff.

Mr. Charles Murray Robertson, the Director who retires on this occasion, being eligible, offers himself for re-election.

Mr. J Hamilton Alston, the Auditor, also retires, and offers himself for re-election.

The approximate acreages are as follows as per recent survey :—

	Acres.
Tea.—In bearing	834
Tea.—Not in bearing	62
Ravines and Waste	62
Timber Clearings	53
Jungle and Patana	31
	1,042 acres.

THE BATTALGALLA ESTATE CO., LTD.

Twelfth annual report to the shareholders :—

The Directors regret that, owing to deficiency in the yield in consequence of unfavourable weather, and the continuance of a depressed range of prices for the produce, the results of the past year have not been satisfactory.

The quantity manufactured has declined from 274,556 lb in 1900 to 218,531 lb last year. The average selling price in London has been 9·34, against 8 38 in 1900, and in Colombo 37·06 cents, against 36 cents the previous year ; the total crop averaged a selling price of 7·50d, against 7·85d in 1900.

London sales amounted to 63,282 lb, netting £2,156 16s 4d. and Colombo sales 154,518 lb, realizing net R55,638·87. This compares with 169,285 lb, netting £5,128 12s 1d, and 104,925 lb, realizing net R37,737·95, sold in 1900 in London and Colombo respectively.

Exchange for drafts has averaged 1/4 19-64, against 1/4 7-16 in 1900.

An interim dividend of 5 per cent on the Shares, free of Income Tax, was paid in October last, and the Directors are unable to recommend any further distribution. A balance of £34 16s 3d at credit of Profit and Loss Account is carried forward.

The best thanks of the shareholders are again due to the Estate Superintendent, Mr G C R Norman, as well as to the Colombo Agents, Messrs E Benham & Co, for their valuable services to the Company for the past year.

In accordance with the articles of Association, Mr Adolf Zimmern retires by rotation, and, being eligible, offers himself for re-election.

THE UNION ESTATE COMPANY OF CEYLON, LIMITED.

REPORT OF THE DIRECTORS.

ACREAGE.

	Tea in full bearing.	Tea not in bearing.	Cocoa.	Cardamoms.	Total Cultivated.	Grass, Jungle & Waste Land.	Total.
Hayes Group	509	3	—	20	532	1,679	2,211
Dea Ella	243	—	81	—	324	162	486
	752	3	81	20	856	1,841	2,697

The Directors now present to the shareholders the accounts of the Company for the past year.

The crops secured on Dea Ella were 77,336 lb. Tea (including 18,207 lb purchased leaf) 164 cwts Cocoa and small quantities of Coconuts, Arecanuts and Vanilla. The Tea realized 30·69 cents per lb and the Cocoa R33·15 per cwt, as against 31·44 cents and R44·30 in 1900. The crops from Hayes Group amounted to 273,281 lb. Tea and 1,101 lb. Cardamoms, which realised respectively 30·71 cents and R1·14 per lb. as against 30 75 cents and R1·21 in 1900.

The fall in prices of all the above products is extremely regrettable, and has been unfortunately the experience of many Companies during the past year.

A loss of R6,286·26 was brought forward from 1900 profit and loss account, and this is now reduced to R830·55 by the profits earned in the past year, R5,455·71; it must however be noted that no provision has been made for depreciation. The mortgage of £3,500 bearing interest at 8 per cent, over Hayes Estate, has been paid off and the necessary money borrowed in London at 7 per cent per annum. The Company's Bankers also called for payment of the overdraft, the money for which was provided by Messrs. Whittall & Co., on the security of a mortgage over Dea Ella Estate.

The only Capital expenditure of importance has been the instalments due for the construction of the Hayes Road, which amounted to R7,035·21: there still remains a liability to Government on this account of R9,261·20, which has to be liquidated by half-yearly instalments, the last being due on 30th June, 1903. Contributions to the extent of R1,991·54 paid by this Company in 1896 and 1898 on account of Hean's Land, to ensure the construction of the road, have been refunded by Government in 1902.

The estimate for 1902 is 345,900 lb. Tea, 150 cwts. Cocoa, 20,000 Coconuts and 2,000 lb. Cardamoms, on an expenditure on Working Account of R99,970·22.

In terms of the Articles of Association Mr. G H Alston now retires from the office of Director, but is eligible for re-election.

The appointment of an Auditor for the current year will rest with the meeting.

THE CEYLON TEA AND COCONUT ESTATES COMPANY, LIMITED.

REPORT OF THE DIRECTORS.

ACREAGE.

		Acres.
TEA.—In full bearing	..	410 2 22
Coconuts	..	559 3 3
Cinnamon	..	21 2 30
Rubber	...	40 0 0
Jungle, Patna and Scrub		375 2 38
Total	..	1,407 1 13 acres.

The Directors have now to submit to the shareholders the accounts for the past year.

THE DIVISION.—The crop secured amounted to 158,963 lb., being 21,037 lb. under the estimate. This is due to the extremely bad season for flushing, and to the continuance of the careful system of plucking.

The cost of laying down the tea in Colombo was 23·31 cents per lb. as compared with 30·47 cents per lb. in 1900, and the nett average price realised was 28·86 cents per lb. against 30 68 cents in 1900. There was no capital expenditure.

COCONUT DIVISION.—The crop gathered was 516,008 nuts, of which 2,430 were sold on the estate at R40 per 1,000 nuts and 4,351 were rejected.

The remainder were made into copra candies 409-2-0.16, and sold at a nett average of R45 58 per candy, as compared with candies 444, 4. 0. 18 in 1900, which realised an average of R44·93 per candy.

The Estimates for the current year are:—Tea, 200,000 lb. against an expenditure on working account of 42,173. Coconuts, 600,000 nuts on an expenditure of R15,569. This crop has already been sold at an advance of R8·50 per candy over last year, Rubber. An expenditure of R750 which possibly will be covered by the yield from trees which are now ready for tapping.

After making the usual provision for depreciation of buildings and machinery, the result of the year's working shews a loss of R3,843·3 as compared with R9,715·92 in 1900.

In terms of the articles of Association, Mr F Crosbie Roles retires from the Board of Directors and is eligible for re-election.

The appointment of an Auditor for the current year will rest with the meeting.

THE PUNDALUOYA TEA COMPANY OF CEYLON, LIMITED.

DIRECTORS.—Messrs. Edward Christian, Charles Murray Robertson and Frederick H Christian. AGENTS IN COLOMBO.—Messrs. J M Robertson & Co. AGENTS AND SECRETARIES.—Messrs. Robertson Bois & Co.

Report to be presented at the fifth ordinary annual general meeting of the Company to be held at the office of the Company on Thursday, the 3rd April, 1902, at twelve o'clock noon.

1. The directors now submit their report for the year ending 31st December, 1901, together with the balance sheet and accounts of the Company made up to that date, and duly audited.

The mortgage on Deeside Estate has been reduced to £4,000, by the redemption of £3,618 7s 7d, aid on the 7th May last.

3. The crop gathered off the 1,640 acres of old tea was 679,079 lb., against 697,359 lb. last year, when the weather was unusually favourable. Part of the

new clearing (viz. 137 acres) was plucked for the first time and yielded 13,500 lb. tea; the whole expenditure on new clearings has therefore been charged to revenue. The small yield of about 100 lb. per acre on these clearings largely accounts for the diminished yield per acreage plucked as shown below on para. 4. The reduced profits are due to this smaller yield per acre, to increased expenditure on manuring, plucking and buildings, and to a fall of rather more than ½d per lb. in the price obtained for the tea.

4. The following statement gives details which may be of interest.

Season.	Acreage Plucked.	Total Tea Crop.	Yield per Acre.	Cost of Crop per lb. f. o. b. Colombo.	Gross Average price obtained per lb Tea.	Average rate of Exchange per Rupee.		Dividend on Ordinary Shares, free of Income Tax.
	acres.	lb.	lb.	d.	d.	s.	d.	per cts.
1901	1,777	692·579	390	5·29	8·37	1	4 3·16	4
1900	1,640	697·359	425	4·86	8·68	1	4 17·64	6
1899	1,640	644·565	393	4·81	9·28	1	4 9·32	6
1898	1,640	627·886	383	5·29	9 27	1	4 3·16	6
1897	1,640	623,699	380	5·22	9·52	1	8¾	6

5. The net profit for the year

amounted to	£5,831 12 9	
To which has to be added Interest	153 10 9	
And the balance from last year of	264 15 9	
Making a Total of ..		£6,249 19 3
The Directors have already paid out of this: Interest for the year upon the Mortgage, less Income Tax	£ 297 3 9	
Dividend for the year upon the 6 per cent Preference Shares, less Income Tax	1,868 12 6	
Income Tax ..	375 8 0	

And they propose to deal with the balance as follows:—

To pay a Dividend of 4 per cent, free of Income Tax, on the Ordinary Shares, requiring ..	2,640 0 0	
To Transfer to Reserve for Depreciation and General Purposes (increasing this Account to £6,750) ...	750 0 0	
And to carry forward the balance of ..	318 15 0	
		£6,249 19 3

6. The Director retiring on this occasion is Mr Charles Murray Robertson who, being eligible, offers himself for re-election.

7. Mr John Smith, the Auditor, also retires, and offers himself for re-election.—By Order of the Board,

ROBERTSON, BOIS & Co.,
Agents and Secretaries.

SCHEDULE OF THE COMPANY'S ESTATES ON 31ST DECEMBER, 1901.

Estate.	Tea in full and Partial bearing.	Tea not in bearing.	Forest and Patna Land.	Forest and Timber Plantations.	Grass Land, Buildings, and Waste.	Total.
Sheen	609	77	112	45	52	acres
Pundaluoya	462	33	15	29	95	634 do
Wootton	306	8	—	39	25	78 do
Deeside	400	—	10	—	26	436 do
Total	1,777	118	137	113	198	2,343 acres

PLANTING NOTES.

CURE FOR INTERMITTENT FEVER.—Methylarsenate of soda, injected hypodermically in doses of five to ten centigrammes, has proved an excellent specific against intermittent fever in the military Hospital of Constantine, Algeria. Nine cases refactory to quinine were cured by it. The results of the trial were communicated to the Academie of Sciences.—*Globe*, March 21st.

PLANTING PROGRESS ON THE ANAMALAIS.—We are glad to have a good account of the young district opened on this S. Indian range in coffee, cardamoms, cacao and tea: all are prospering and promise well: 8 cwt. an acre crop of coffee on an estate under 5 years is spoken of. Cinchona (Ledger) is also being planted interspersed with camphor. There are now 7 resident planters.

COMPANY MEETINGS.—Three Company meetings were held in Colombo today. The shareholders of the Drayton Estates Company have, it will be seen, approved of the sale of Yuillefield estate to Mr Charles Shuttleworth for £9,500. For the further working of the Plumbago Mining Company a sum of R10,000 is required and, unless that is secured by the end of the month, the company will be wound up. We regret to notice that the result of the year's working of the Ceylon Tea and Coconut Estates Company is a loss of R3,843·3.

COCAINE IN BENGAL.—The following notification of the Board of Revenue has been published:—Cocaine having been declared an intoxicating drug under Bengal Government Notification of October 23rd, 1900, and having thereby become an excisable article, the sale of it without a license has become illegal under Section 11, Act VII. (BC) of 1878, and punishable under Section 53 of the said Act. It is now hereby notified for general information that the sales of cocaine will not be allowed at all except for *bona fide* medicinal purposes, and that licences for the sale of it will be given to any persons other than approved druggists and chemists. Druggists and chemists desiring to take out licences should apply to the Collector, who will grant the licences, under certain specified conditions, to duly approved persons and firms. Druggists and chemists will be allowed up to March 1st, 1902, to obtain their licences. After that date the law will be put into operation against druggists and chemists, as well as against any other persons, who may be found selling cocaine without a licence. The West-end of London is evidently not the only place where the cocaine habit predominates.—*Chemist and Druggist*, March 22.

MORE ABOUT RUBBER.

Les Plantes a Caoutchouc et leur Culture, par le Professeur Dr. O. Warburg. Traduction complétée et annotée par J. Vilbouchevitch.* This translation of Prof. Warburg's able and complete work will be invaluable to those to whom the German volume was a sealed book. The translator prefaces his book by stating that M. Warburg is one of the most noted of the botanists of the Faculty of Berlin and is also professor of the Course on Colonial Products in that city. He is the head of the *Tropenpflanzer*, a monthly periodical. M. Warburg has also travelled in the tropics, and his work has been written especially for practical men who intend to cultivate rubber. Scientific knowledge has, however, advanced considerably since M. Warburg's volume appeared. Thus, to take only one instance, the Landolphias of Africa, some of which were said to yield good Rubber are now rejected. Again, the statistical portion required revising. "We have, therefore, completed the German text and made several additions culled from the personal experiences of such men as M. M. Chevalier, A. Godefroi Lebœuf, J. Grisard, Dr. Heim, A. Michelin and E. de Wilderman. We have also largely increased the number of illustrations, thanks to the loan of several negatives. Our translation is thoroughly faithful, the author himself having assisted us in some doubtful parts. Thanks to our several additions, &c., this volume contains 300 pages as against 150 pages in the original volume."

M. Warburg in his Preface states that though when he first wrote (1898), most of the Rubber of Commerce was procured from natural forests; yet Rubber was being planted in many directions and the documents about the various kinds suitable for cultivation were scattered in such a multitude of periodicals, &c., that he had set himself to collect and submit to careful criticism and analysis the information thus gained. His statistical Introductory chapter on the production and consumption of rubber shows how world-wide is the problem before us. Thus, his tables show quantities and countries from which rubber is procured and to which it finds its way—also the re-exportation. Some 42 pages are taken up with this. The other chapters are headed as follows:—II. Para Rubber; III. Castilloa; IV. Ceara Rubber Tree; V. Mangabeira Rubber; VI. The African Rubber Plants; VII. Ficus Rubber; VIII. Various Rubber Trees of minor importance; IX. Table of Weights and Monies. Index. 26 illustrations are included and the above chapters occupy about 45 or 50 pages each.

It is impossible to give further details of so complete a work. The book must be possessed by those who make the subject their life work, for it is full of interest, as much practical as scientific.

*Paris: Augustin Challamel, Editeur Rev. Jacob 17, Librairie Marine et Coloniale.

FORESTS AND WATER-SUPPLY.*

(An instance from history)

Everybody has heard of the monks of La Trappe, or Trappists, an order whose vows include a life of silence coupled with 8 hours' hard work daily. The monastery was founded in 1140 by Rotrou II., Count of Perche, after losing his wife and his brother William in the wreck of 'La Blanche nef.' The forests with which it was endowed were kept till the Revolution, when they were confiscated to the State. Under which of the 'rights of man' this course was justified it boots not to enquire.

Whether the Trappists had been abusing their forests is not distinctly explained, but it appears that they had certainly been cutting the coppice portion (the greater part) too young, for at the Reformation of 1665 an edict went out against them. This no doubt emanated from the great Colbert, and ran thus:—'The religious community, the abbot, prior and convent of Notre Dame de la Trappe, &c, are hereby forbidden to cut any of the woods attached to the said abbey before the age of fifteen years, seeing the poverty of the soil. They shall regulate their coupes into fifteen equal fellings, and they shall leave standing at each felling the number of standards required by law; they shall allow one-third of their forest area to grow as high forest on the best soil in proximity to the Abbey itself.'

This was duly observed till 1700, when the Abbe de Rance died, after ruling the monastery wisely and well for thirty-seven years. After his death the Trappists thought they would launch out into great ironworks, and the forests had to pay for the disastrous experiment. An old book 'The Life of Dom Pierre, the Dwarf, cleric and former sub-prior of the Abbey of la Trappe,' 1715, states the matter with due appreciation:—'Iron ores have ever been plenty about the Abbey of la Trappe, and many times had the holy father, the late Abbe, been supplicated that he would allow it to be dug out by private persons who desired to establish ironworks. The abbey might expect much profit and no expense. Never would Dom Bouthillier de Rance yield, for he foresaw beneath the promise of large profits the certain ruin of the revenues of his house, coupled with spiritual demoralisation and the relaxation of all the orderly life which he had been at so much pains to institute.

'But hardly was this holy man laid to his rest than Dom Jacques de la Cour, the new Abbe, lent a willing ear to the proposals of certain monks whose vows of solitude, &c, weighed too heavy on their impetuous natures. He took up a contract to run the iron works of la Trappe for thirteen years, and agreed to pay 2,800 livres for every year. Their destruction ran loose in the forests. Nobody knows how wastefully the furnaces swallowed up wood that might have been simply sold to far better effect. *The springs soon dried up and the ponds* (they had always depended on a series of ponds for water-power) *became unable to supply more than six weeks' water for the year.* The fires had to go out. The cost of relighting them at intervals was prohibitive. Thus fell to the ground all the ambitious hopes of the new Abbe. La Trappe became desperately indebted, much of its property had to be sold, and the monks were often in absolute want of the necessaries of life.' Dom Jacques de la Cour became naturally Don Jacques de la Sacque, and the ironworks, the monastery, and the forest were involved in a common ruin. So far as the forests are concerned, the State is now working them under a plan of 1894, in three series; a high forest under sixty years' provisional plan, and 2 coppices with standards.

Such is a story that was printed two hundred years ago, long before forest officers and their opponents began to seek for proofs of another disputed matter." F. G.

—*Indian Forester*, March.

* "La Foret de la Trappe," *Revue des Eaux et Forets* for November 1901.

"THE UTILITY OF ALKALINE PHOSPHATIC MANURES."

Mr. John Hughes calls our attention to a paper under this heading read by him at a meeting of the Society of Arts on 12th March ult., when Mr. A. D. Hall, Principal of the South-Eastern Agricultural College, occupied the chair. We shall reproduce the essay and discussion in full in our *Tropical Agriculturist*; but meantime may mention that after an animated discussion, in which nearly all the speakers—the Chairman, Messrs. Hermann Voss, John Ruffle, F. J. Lloyd, Dr. S. Rideall, Messrs. Edward Packard, James Hudson, Dr. Teed and D. A. Louis—spoke of the great value of Mr. Hughes's discovery, the latter in summing up, said:—"He thoroughly believed in superphosphate; but its use ought to be restricted to soils which contained plenty of lime, just as basic slag was confined to soils which were particularly sour, and the new manure to intermediate soils. . . . . It is not scientific, it is not economical, that one kind of manure should be sold for application to all kinds of soils.—Acid manures may with advantage be applied where there is plenty of lime, and alkaline manures may be more profitably applied where lime is deficient."

HUMUS AS A PERSERVATIVE AGAINST FROST.

I have just read a French translation, by my old friend, Prof. Henry, of the Nancy Forest School, of Wollny's classic work on the decomposition of organic matter. In it I find the statement that spring and autumn frosts are dangerous on peaty soils, only when the surface of the latter is dry. Wollny gives no illustrations of this law, but I recently observed one in my garden at Cooper's Hill.

Last September, I dug up several rose beds on my lawn and sowed them with grass seed, which has produced a fine crop of young grass. This I carefully watered, and the soil in the beds was well trenched and covered with decomposed leaf mould before the seed was sown. The rest of the lawn has not been trenched, probably for thirty years, and the soil under the grass in it a stiffish loam, is now singularly dry for the time of the year. On the morning of Dec. 6th there was a slight frost, 31o F being registered six inches above the grass. At 8 a.m. the lawn was white with rime, except on the new grass, which remained green. This must be due to the fact that the moist, well-trenched humus soil under the new grass was able to conduct heat from below and thus kept the air in contact with it above the freezing-point, while the dry, compact loam under the old turf could not supply sufficient heat to the old grass to preserve it from freezing. Dry humus, according to Wollny, has a low specific heat, and is a bad conductor, while wet humus has a high specific heat, and is a good conductor of heat. On another occasion when snow fell, it melted much sooner on the new grass than on the rest of the garden. As a further illustration of Wollny's law I may cite the fact that water is let on to cranberry swamps in Carolina when frost is feared during the blossoming period, and also that in north-West India, on clear evenings when frost is feared, vegetable gardens and sugar-cane plantations are irrigated in order to obviate danger from frost. Kikur (*Acacia arabica*) plantations in the Punjab are also irrigated when frost is feared. It is also well known in Germany that, if a sphagnum peat bog is to be reproduced, a thin layer of peat must be left at the base of the bog after the upper peat has been removed, and this layer kept carefully under water, as otherwise the drying up and consequent freezing of the peat will kill the moss. Slight frosts are very prejudicial to vegetation in sub-tropical forests, and when frost is imminent, the precaution of trenching the soil, removing weeds and irrigating cultivations is extremely important for young sugar-cane and other crops. W R FISHER.

Cooper's Hill, Dec. 8.

—*Indian Forester.*

TEA IN NATAL.

200 PER CENT INCREASE IN IMPORTS: NO EXTENSIONS RECORDED.

The Annual Report of the Durban Chamber of Commerce, shows £37,000 worth of tea imported during 1901 as against £12,000 worth in 1900. On the other hand exports of tea grown in Natal show but a slight increase, under 16 per cent—£15,000 worth in 1901 as against £13,000 worth in 1900. £4,111 worth of tea was sent from Natal into the Transvaal, £1,238 to Orange River Colony, £916 over the East Griqualand border (to the south west) and £143 over the Pondoland border.

We have also the following "tea" paragraph:—

No accurate statistics are available of the area under cultivation or the crop for the season. An estimate, however, has been made that by the end of May the output will be not far short of one-and three quarter million pounds weight, say, an advance of 250,000 lb. on that of last year. The chief consumption is within the Colony, but of the exports of 545,047 lb., valued at £22,823, the Cape Colony absorbed 442,000 lb. The area under cultivation may be reckoned as about 4,000 acres.

THE PEARLING INDUSTRY IN NORTH AUSTRALIA.

Representative V. L Solomon (S.A.) has addressed the following letter to the Prime Minister of the Commonwealth:—"My attention has been drawn by my constituents in the Northern Territory to the position in which some of them are placed owing to the provisions of the Immigration Restriction Act of 1901, which will render it difficult, if not impossible, for those engaged in the pearling industry to procure the necessary labour for manning their boats. The magnitude and importance of this trade will be better understood after a glance at the following figures. The export of shell from Queensland for the year 1900 was 1,250 tons, valued at £128,451; from Western Australia for the same period, 733 tons, valued at £86,423, and pearls valued at £20,000; from the Northern Territory, 175 tons, valued at £22,674, or a total of 2,158 tons of shell and pearls valued in all at £257,553. There are a very large number of boats employing many thousands of hands as divers, crews, &c., in this industry, the whole product of which passes through the hands of European traders at our ports, and the whole of the stores and supplies required by the men are obtained in Australian ports, and contribute customs duty to the Commonwealth revenue

The crew of each boat live on board the boat, visiting the shore only for the purpose of trade, purchasing their stores, and packing their shells for export; and, as their work is in most instances carried on outside of the three-mile limit, none of those dangers which the Immigration Restriction Act is designed to prevent can possibly be anticipated. This question is of such vital importance to a vast number of boat-owners and business people settled in the northern portion of the continent that I feel justified in urging your Government to give it your earliest and most favourable consideration."

Brisbane, March 25.—The Home Secretary has received an important telegram from the Government Resident at Thursday Island bearing on the threatened removal of the headquarters of the pearl shelling industry to Dutch New Guinea on account of the operation of the Immigration Restriction Act. Mr. Mitchell, manager of Messrs. Burn, Philp. and Co., arrived from Dutch New Guinea on Sunday, and reports favourably regarding the Marouky's River. The entrance to the river, he states, is well marked. There is 3½ fathoms of water on the bar, and the river is navigable for 40 miles. He describes the soil as rich with extensive groves of coconuts. The Dutch have built spacious houses and barracks, and have 400 soldiers besides artificers. The community numbers 600, and more are expected shortly. There is a monthly service by steamer from Java. Mr. Kroesen, the President, says the port will be full. "The pearl-shellers here," says the Hon. John Douglas, "are a good deal attracted by the prospects opened out to them, but as yet have made no move." Mr. Douglas's report was confirmed. The Premier regards it as extremely likely that in the present conditions there will be an exodus to Dutch New Guinea. He would not sit quietly down and see this brought about, and it is probable that a direct appeal in connection with the matter will be made to Mr. Chamberlain.—*Adelaide Observer*, March 29.

CRYSTALLINE LIMESTONES OF CEYLON.

[FROM THE ABSTRACT OF PROCEEDINGS OF THE GEOLOGICAL SOCIETY OF LONDON.]

March 12th, 1902.—Sir Archibald Geikie, D.C.L., LL.D., F.R.S., Vice-President, in the Chair.

The Rev. H H WINDWOOD thanked the Chairman for allowing him to introduce the water-colour drawings by his friend, Miss Breton, of some of the grandest canons in North America. The geological accuracy of the drawings might be attributed to the fact that Miss Breton was the daughter of an old Fellow of the Geological Society.

The following communication was read:—

1. 'The Crystalline Limestones of Ceylon.' By Ananda K. Coomaraswamy, Esq., B. Sc., F L S, F G S.

The crystalline rocks of Ceylon may be divided into three series:—

(1) The Older Gneisses.
(2) The Crystalline Limestones.
(3) The Granulites (Charnockite Series)—pyroxene-granulite, leptynite, etc. A local subdivision of this series is the Point de Galle Group—wollastonite-scapolitegneisses, etc.

The crystalline limestones of Ceylon are intimately associated with the banded pyroxene and acid granulites (Charnockite Series). They form bands with outcrops from a few feet to over a quarter of a mile in width, interbedded with the granulites: The limestones themselves have a banded structure (foliation) parallel to that of the granulites and to the boundaries. This foliation of the limestone depends on variations in structure, amount of accessory minerals, and relative proportion of calcite and dolomite. The grain is coarse, sometimes exceedingly so. Parallel and graphic intergrowths of calcite and dolomite are very characteristic. The most abundant accessory minerals are olivine, phlogopite, pink or violet spinel, diopside, pyrite, and blue apatite; less common are amphiboles, clinohumite, green spinel, etc. The most characteristic contact-minerals are diopside, amphibole, green spinel, and greenish micas; and, rather in the granulite than the limestone, scapolite, phlogopite, diopside, sphene. There occur also in the limestones, nodular mineral aggregates composed of characteristic minerals such as diopside, phlogopite, blue apatite, and spinel.

There are often transitions between the limestones and granulites. In some other cases a zone of green rocks (with diopside, dark mica, amphibole, and green spinel) intervenes. Bands (sills) of granulite of various width, down to less than a foot, may occur in the limestone, and are parallel to the foliation and general strike. They show peripheral transitions to the limestone by incoming of original calcite and the appearance of lime-silicates, or are separated from it by a zone a few inches wide, in which the minerals diopside, amphibole, and green spinel are characteristic.

Some interrupted sills are described, and compared with the interrupted dykes of nepheline-syenite in the crystalline limestones of Alnö, described by Professor Högbom. A sill may thus be continued along the strike as a series of lenticles. Elsewhere quite isolated masses of pyroxene-granulite occur as inclusions in the limestone.

Although the relation of the granulites to the limestones is on the whole intrusive, the two rocks in their present condition are essentially contemporaneous, and seem alike to have consolidated from a molten magma. The calcite occurring in the granulites near the contact has all the appearance of an original mineral. The foliation of the limestones is regarded as a sort of flow-structure, and corresponds with that of the granulites to which it is always parallel. That the foliation does not result from the action of earth-movements on a solid rock is shown by this, that the very minerals whose variable distribution is one of its chief causes, have certainly not been affected by deforming earth-movements, nor are they such as to have been produced by these; moreover, in this respect a distinction cannot be made between the limestones and granulites, which would necessarily have suffered alike had they been subjected to deforming strains since the consolidation of the latter. The original nature of the limestones is less evident: they may have been sedimentary or tufaceous, and, if so, subsequently softened and metamorphosed; or possibly *ab initio* truly igneous rocks, and related to the charnockite-magma. Reasons for and against these views are given. The relations between the crystalline limestones and nepheline-

syenites of Alnö have suggested to Prof. Högbom that perhaps the limestone may have been a product of the nepheline-syenite magma there.

The author feels sure that the crystalline limestones of Ceylon have not arisen by the alteration of the basic lime-silicates of the pyroxene-granulites, although Prof. Judd has advanced this theory in connection with the crystalline limestones of Burma, which seem to resemble those of Ceylon in many ways.

DISCUSSION.

Mr. PARKINSON, after expressing his sense of the value of the paper and the care and elaboration with which the details had been worked out, described the contact of granulite and limestone which he had seen near Matale, and remarked that he believed that this section proved, firstly, that the granulite was intrusive, and, secondly, that the intrusion had been attended by absorption of the limestone, which had locally modified greatly the composition of the granulitic magma. As to the original nature of the limestones, he could say nothing; the interrupted sills and isolated masses of the granulite which had been described were very puzzling facts, and he inclined to the opinion that the author's contention that 'the two rocks in their present condition are essentially contemporaneous' was the hypothesis most nearly in accord with the facts.

Mr. HOLLAND thought that the author's self-imposed task of attacking the crystalline problems of Ceylon deserved the highest commendation of the Society, and the additional facts now published formed a great advance on previous work in that area. But he considered that the evidence offered was utterly insufficient to establish the Author's contention that the crystalline limestones had behaved as igneous rocks, and formed part of the magma which gave rise to the associated Charnockite Series. He (the speaker) had described primary and original calcite in a nepheline-syenite from Southern India, as Adams had done for Ontario and Högbom for Alnö; and though he was convinced that calcite might be dissolved without decomposition, and subsequently separated from a nepheline-syenite magma in which there was no free silica and an excess of electropositive alkali, it would be impossible for a limestone and charnockite to come into igneous contact without a chemical reaction which would result in the alteration of both rocks. The phenomena described by the Author were precisely those which would be expected theoretically from the intrusion of a charnockite into a pre-existing limestone. The limestones had been as a whole raised to a high temperature, and (as he had previously suggested from other evidence) had been brought to a condition probably akin to fusion, in which condition there would be a sufficient freedom of molecular movement to account for all their structural peculiarities—the inter-growths of calcite and dolomite, the flow-structures, and the occurrence of large phenocrysts of accessory minerals, which did not indicate an igneous condition any more than the large chiastolites of chiastolite-slates. The absence of cataclastic structures did not indicate freedom from deformation after solidification, as Adams and Nicholson had proved that marble, under differential pressure and at a temperature no higher than 400° C., could be made to flow like glacial ice without the production of cataclastic structures. The plasticity of the limestone at temperatures well below the fusing-point of any rock was sufficient to account for the steam-like disposition of the inclusions, as well as the dislocation of the charnockite-sills without internal deformation. In India are seen corresponding contact-phenomena where the charnockites invade aluminous rocks (the khondalites of Walker) and siliceous rocks (quartzites of various kinds), and these, like the limestones, have their nearest chemical equivalents among known sediments. In places these para-schists and paragneisses predominate over the orthogneisses; while in the south, where denudation has proceeded to greater relative depths, they are subordinate in quantity, and in Ceylon the limestones now exposed are apparently mere inclusions in the Charnockite Series.

Prof. JUDD expressed his gratitude to the Author for bringing forward a description of a district so interesting to geologists. The rocks described were similar to those of Burma, except in the remarkable absence of certain minerals, such as corundum and its derivatives. He found great difficulty, as the author did, in realizing that the charnockites could be intrusive in the limestones. In Burma and Ceylon alike, whatever might be the case in Southern India, the limestones were remarkably subordinate to the silicate rocks, instead of the reverse being the case (as we should expect, if the latter were intrusive in the former). He agreed with the previous speaker as to the difficulty of imagining the limestones to have behaved as igneous rocks, and yet their relations with the igneous rocks were puzzling in the extreme. He referred to the occurrences of Glenelg and Tiree as affording fine illustrations of the part played in such a complex by calciphyres.

Mr. GREENLY remarked that in the Hebridian Gneisses of the North-west of Scotland there was also a great preponderance of igneous over what appeared to be sedimentary material. The Loch Maree Group was now generally regarded as sedimentary, but it was a comparatively narrow zone, while from Loch Maree to Cape Wrath all appeared to be igneous. Limestones were a conspicuous feature of the Loch Maree Group, but they were accompanied by graphite-schists, mica-schists, and other probably sedimentary rocks.

The author, in reply to Mr Holland, said that no doubt in most cases crytallines were a result of the recrystallization of calcareous rocks under pressure; behaviour as a plastic medium did not involve a very high temperature, as had been proved by the work of Adams and Nicholson. But the limestones of Ceylon posssessed a number of peculiar characters which, taken together, suggested to him that they had existed in 'a state akin to fusion.' With regard to the interrupted sills, if this phenomenon was due to 'pinching' while both rocks were in a solid state (as Mr Holland had suggested), why did the narrow lime-silicate contact-zones completely surround the lenticles, instead of occurring only on two sides of the granulite, as in the sill itself? Moreover, the accessory minerals in the lime-stones would show some trace of deformation if such powerful earth-movements had affected their matrix.

In reply to Mr Greenly, the author said that rocks composed mainly of biotite and garnet, which he regarded as of sedimentary origin, were scarce; no rocks with kyanite, andalusite, or sillimanite were known *in situ*. Even if such exist, and are the remains of sedimentary rocks, the igneous rock must greatly exceed

them in amount. No graphitic schists had been found. Finally, the author said that he had no wish to lay great stress on his 'igneous' theory, and he regarded the descriptive portion of his papers as of much more importance than the theoretical.

DEVELOPMENT OF WASTE LANDS IN THE NORTH:

TRAFFIC FOR THE RAILWAY;

COTTON—SUGAR—TOBACCO.

The rumoured poor traffic returns from the Jaffna railway section have brought "prophets of evil" once more to the front and one of them has been saying that the man who believes in our great Northern Railway being profitable, may be compared to the sailor who, hearing that parrots lived for a hundred years, bought one in order to test the truth of the statement! For ourselves we shall be much disappointed if at least the Jaffna section of the Railway does not prove profitable, in the face of the dense population of the Peninsula. But, of course, there has hitherto been no experience of how a purely Tamil community—"the Scotchmen of the East"—may care to spend money on railway travelling. In the case of the Sinhalese it has been demonstrated that the villagers almost too freely patronise the comfortable third-class carriages, making this branch the most profitable of passenger traffic. It is, however, too soon to judge of the Jaffna Tamils.

But in any case, the opening of the first section of the Northern Railway should direct more attention to the exploiting and utilising of the North-Central country, at least along the railway route. No one expects that trains will run "full up" when the whole line is open to traffic—not even the warmest advocates of the extension without reference to route or gauge; and Sir West Ridgeway will prove himself a far-seeing administrator as well as a vigorous and earnest advocate, if he begins to encourage cultivation by exceptional inducements, if he wishes to see the line become a financial success within the time of his successor. And cotton is one of the products to which both climate and soil over a great part of the route, point as one likely to be successful. Let the Revenue Officers along the line be instructed to start experimental stations, under the guidance of the Director of the Botanical Gardens, and let the best seed available be procured; and that promptly!

This is neither the first, nor the second, time we have counselled the importance of taking time by the forelock, if the Northern Railway is not to prove a burden on the revenue for an inconveniently long period. We should be only too glad if the event convict us of pessimism in expecting an initial loss. There are few, we imagine, who expect the line to do more than pay working expenses for a time; but even assuming that the Railway may prove financially satisfactory from the start, there would be no harm in the adoption of measures calculated to develop traffic and to promote the prosperity of the country. Admittedly, the population of the interior parts is both scanty and poor, and admittedly the climatic conditions are not such as to attract Europeans; but European capital is essential for operations which would contribute appreciable traffic to the new line. It is in the power of the Government—if not alone, at any rate more quickly and more certainly than private individuals,—to demonstrate the suitability of the country for remunerative cultivation, in order to attract capital. We have before now drawn attention to the probability that part of the country will be found suitable for Sugar, in the opinion of an expert of our acquaintance with large Eastern experience. More recently still we introduced to public notice Mr. MacDougal Gibson who is very hopeful of a great future for the country through Tobacco. And now we desire to emphasise the absolute need of early and thorough experiments with Cotton. At the recent annual general meeting of the Upper India Chamber of Commerce, some facts were brought to light which should receive earnest attention here, and lead to profitable imitation. It was stated that the experimental cultivation of American Cotton at the Cawnpore Agricultural Farm proved that Cotton can be acclimatized in a few years by a system of cultivation which can be adopted by any intelligent ryot, and that the results are a yield five times in weight of that obtained from the local product, and of a fibre suitable for spinning up to 60s instead of 20s. If, as the President stated at that meeting, "a mine of wealth lies literally at the feet of the cultivator" in India, why should it not be so here, too? Let our local Department of Agriculture answer.

CEYLON INVESTMENTS.

TEA SHARES AT THE LOWEST POINT YET TOUCHED.

Out of twenty-seven Companies, in the shares of which there have been dealings during the quarter, only six have secured a more favourable price, whilst in the remaining twenty-one cases the fall has, in some cases, been serious. It must be remembered, however, that this, the first quarter of the year, with Rupee as with Sterling Companies, is the period for dividend paying and the large drop of Rs 552,720 is partly to be explained by some of the sales having been made after the payment of the dividend; but it is, in any case, decidedly disappointing that the continued favourable state of the tea market has had so little effect upon the quotations. Since last return we have included Rs 5,000 added capital, issued by the Pitakande Company, and Rs 25,000 by the Rutwatte Company. Commercials have, largely by the increase in the quotation for Galle Face shares, recovered from the set-back they experienced last quarter, although "Steams" and "Ices" are still on the down-grade. Hotel shares,

with the exception of the Galle Face, the Kandy, and a small rise in the Nuwara Eliya Hotels have not had a favourable quarter, and indeed, it may be said of the whole state of the share market that the prices for the quarter show that investors are "sitting very tight" indeed. The list of Commercial undertakings has received three additional companies, viz., those of the Kalugangа Navigation Company, the Ceylon Ice and Cold Storage, and the Colombo Brick and Tile Company. We may mention that the share list of the last-named Company was subscribed immediately, an unusually successful flotation, which has no paralle during the past two or three years.

The tables are as follows:—

RUPEE PRODUCE COMPANIES.

RISE AND FALL IN THE FIRST QUARTER 1902.

	Ordinary Capital.	Market Value of Shares. Dec. 31	Mar. 31	Rise or Fall
	R	R	R	R
Agra Ouvah	..375,000	675,000	600 000	— 75,000
Castlereagh	...240,000	180,000	228,000	+ 48,000
Ceylon Provincials	..666,000	666,000	666,000	—
Ceylon Tea and Coconuts	... 348,000	348,000	348,000*a*	—
Claremont	... 65,000	16,250	16,250*a*	—
Clunes	...332,000	166,000	166,000	—
Clyde	...270,000	135,000	81,000	— 54,000
Doomoo	..400,000	260,000	280,000	+ 20,000
Drayton	...715,000	1,072,500	1,072,500*a*	—
Ella	...300,000	90,000	82,500	— 7,500
Estates of Uva	...710,500	298,410	269,990	— 28,420
Gangawatte	...178,000	—	—	—
Glasgow	...325,000	617,500	614,250	— 3,250
Great Western	...584,000	712,480	712,480*b*	—
Hapugahalande	170,000	170,000	170,000*a*	—
High Forests	...750,000	825,000	750,000	— 75,000
Do. Part Paid	200,000	225,000	180,000	— 45,000
Horrekelly	..400,000	330,000	320,000	— 10,000
Kalnara	...400,000	200,000	200,000	—
Kanapediwatte	...334,000	283,900	283,900	—
Kandyan Hills	...125,000	50,000	56,250	+ 6,250
KelaniT.Garden	300,000	75,000	105,000	+ 30,000
Kirklees	..100,000	120,000	50,000	— 7,000
Knavesmire	...415,000	228,250	166,000	— 62,250
Maha Uva	...300,000	240,000	210,000	— 30,000
Mocha	...404,000	585,800	565,600	— 20,200
Nahavilla	..396,500	237,900	237,900	—
Neboda	...261,000	261,000	261,000	—
Palmerston	...410,000	328,000	328,000	—
Pattiagama	... 80,000	—	—	—
Penrhos	...150,000	135,000	127,500	— 75,000
Pine Hill	...208,740	139,160	139,160	—
Pitakanda	..310,000	310,000	310,000*a*	—
Putupaula	...200,000	210,000	240,000*a*	—
Ratwatte	...125,000	62,500	60,000*b*	— 2,500
Do added C'tal	25,000	25,000	25,000	—
Rayigam	...600,000	240,000	195,000	— 45,000
Roeberry	...300,000	210,000	210,000*c*	— —
Ruanwella	...265,000	92,750	106,000	+ 13,250
St. Helier's	... 50,000	50,000	50,000*b*	—
Talgaswela	...200,000	55 000	40,000	— 15,000
Tonacombe	...280,000	182,000	168,000	— 14,000
Udabage	...170,000	68,000	68,000*a*	—
Udugama	...315,000	63,000	63,000*a*	—
Union	...320,000	80,000	70,400	— 9,600
Upper Maskeliya	350,000	297,500	350,000*b*	+ 52,500
Uvakellie	...240,000	156,000	144,000	— 12,000
Vogan	...720 000	378,000	270,000	—108,000
Wanarajah	...378,000	756,000	756,000*b*	—
Yataderia	...190,000	570,000	541,500	— 28,500
Total	15,951,240	13,506,900	12,954,180	—552,720

a No quotation during quarter.
b Latest price during quarter, no quotation in latest list.
c Buyers' prices have been taken in the absence of transactions or sellers' quotations.

RUPEE COMMERCIAL COMPANIES.

	Ordinary Capital.	Market Value of Shares. Dec. 31 1900.	Mar. 31 1901.	Rise or Fall.
	R.	R.	R.	R.
Adam's Peak Hotel ...	113,800	34,140	35,670	+1,530
Bristol Hotel ...	315,000	330,750	283,500	—47,250
Ceylon General Steam Navigation ...	75,000	168,750	165,000	—3.750
Ceylon Ice and Cold Storage...	450,000	450,000	450,000	—
Colombo Apothecaries ...	400,000	550,000	580,000	+30,000
Colombo Assembly Rooms ...	27,520	21,570	20,640*c*	—930
Colombo Brick & Tile Co. ...	150,000	150,000	150,000	—
Colombo Fort Land & Building	360,000	306,000	306,000	—
Colombo Hotels	500,000	1,487,500	1,375,000	—112,500
Galle Face Hotel	650,000	900,000	1,300,000	+400,000
Kaluganga Navigation ...	50,000	50,000	50,000	—
Kandy Hotels ...	250,000	275,000	300,000*c*	+25,000
Mount Lavinia Hotel ...	350,000	245,000	210,000	—35,000
New Colombo Ice	210,000	267,500	330,750	—36,750
Nuwara Eliya Hotels ..	42,000	38,500	42 000	+3,500
Public Hall ...	55,000	24,500	21,000	—3,500
Total ..	3,978,320	5,399,210	5,619,560	+220,350

—Local "Times,"]

THE BRITISH SOLOMON ISLANDS.

The report of the Resident Commissioner of the British Solomon Islands for the past official year gives the white population of the archipelago on March 31 last as 76, of whom 50 were British. Forty-eight were engaged in trading, prospecting, and pearl-shell diving, 13 were members of the French Marist mission, and most of the remainder were in Government service or were women and children. For the third year in succession no death was due to attack by natives. The revenue has steadily increased from £957 in 1897-98 to £1,9?3 last year. Trade also has increased. The exports last year amounted to £28,260

COPRA IS THE CHIEF STAPLE,

and it is likely to go on increasing as the plantations now forming by the whites come into bearing; pearl-shell, ivory nuts, turtle shell, and beche-de-mer are the other exports. The area under cultivation by white owners is increasing annually, and the planting industry is likely to develop rapidly, and should the Commonwealth stop recruiting altogether the supply of labour would be utilised for local requirements. The immediate result of the Queensland labour trade would be a loss of revenue to the islands from the licences granted to labour ships, but this would be met eventually by increased local revenue. There is now regular steam communication with Sydney, but the Commissioner complains that it is not direct, and argues that the growth of the Solomon Islands justifies a direct steamer, and makes the archipelago worth the attention of the Sydney merchants, for the export trade now is larger than that of the New Hebrides or of New Guinea (excluding gold). All the

COPRA IS NOW CONVERTED INTO SOAP AND OIL CAKE

in Sydney itself, and that port must long continue to be the base of the Pacific island trade. The settlement of outstanding land claims also is a matter demanding attention in the interests of progress in the islands,

Before the declaration of the British Protectorate transactions, alleged to have been purchases of land, took place between whites and the natives. In some cases these were reasonable in their nature, and the purchasers have subsequently by occupation acquired what are presumed to be indefeasible titles. In others, however, the claims of the alleged purchasers have been extravagant. Square miles were obtained at a small fraction of a penny per acre, without any inquiry into the title of the vendor, who was frequently the first native met on the beach, and there has been no occupation. Until all the claims have been dealt with, once for all, the agricultural progress of the islands will be retarded.—London *Times*, March 15.

GEM MINING IN CALIFORNIA.

The recent deposit of a specimen of California jade in the park Museum directs attention to California as a field for gem mining, observes the San Francisco *Chronicle*. "Excepting a tourmaline mine in San Diego county, and a turquoise mine near the southern Nevada border, we believe no systematic effort at mining for gems has ever been made here. The pebble beach near Pascadero has yielded at times some valuable stones, but whether they came from the neighbouring formation, or were cast up by the waves from the bottom of the sea, has not been ascertained. Opals have been found on the beach in the neighbourhood of San Diego, and diamonds of good quality have occasionally been picked up in the sluices of some of the placer mines in the northern counties.

"The turquoise and tourmaline deposits are specially valuable. Handsome gems are made from both. The latter is found in the form of variegated crystals, and gems have been produced from them which were splendid imitations of diamonds of the purest water, pigeon-red rubies sapphires, emeralds and pink and yellow topazes. Montana contains large deposits of sapphires of splendid quality, but no deposit of any consequence of that gem has been found in California. It is offset, perhaps, by the turquoise deposits, especially as this stone is now popular. But the California deposit is so large that the market could easily be broken by an excessive output, so the production is regulated to suit the wants of lapidaries and jewellers.

"In Calaveras county there is a mine which is worked expressly for the quartz crystals it contains. These are not exactly gems, but the crystals are so large that enormous ornamental globes of exceptional value are obtainable from them, and these are in high demand. Japan had formerly a monopoly of this business. But the largest quartz crystal ever found is said to have come from this California mine. Another variety of quartz used for gem-making found in this state is chrysophrase, which takes a beautiful polish. Its color is usually a pale apple-green. Some attention is at present being given to the development of this material in this state for gem-making purposes. It is allied to nickel and usually associated with it, and it is believed to be present in the nickel deposits found near Riddles, in southern Oregon. Valuable deposits of it have been found in California recently. But the most valuable of all recent discoveries of precious stone deposits in California is said to be that of the jade, which was lately added to the Park Museum collection. Its quality is of the finest character, and the deposit is said to be large enough to be quarried in blocks big enough for monumental purpose.—*Bradstreets*.

PEARL FISHERIES IN BENGAL.

HANDSOME RETURNS.

Calcutta, April 9.—Some valuable pearls, some of which are being sold for R400 and R600 each, have been obtained at the fisheries on the Ichamati River, where pearl fishing is carried on. The yearly return has been so good that the fishermen have stopped selling fish.—*Madras Mail*, April 10

THE "NEEM" OR "MARGOSA" TREE.

Melia Azadirachta.

A planting correspondent writes :—

"What is Neem? Can any of our readers enlighten us as to the identity of the neem leaf, and tell us whether there is any plant allied to the neem indigenous to the Island or cultivated here? An Indian paper has this :—'With regard to the efficacy of neem leaves as a disinfectant, it is interesting to learn that Baroda, which is situated between Borach on one side and Wasad and Nadiad on the other, and where hundreds of people go daily from places infected with plague, is free from the epidemic. In this connexion it is pointed out that until recently there was a special agency employed in Baroda for daily burning, for about an hour, fresh neem leaves for ten days in those houses in which deaths had occurred, no matter from what cause, and also in the neighbouring houses.'"

Our correspondent will no doubt recognise the tree by its other name "Margosa" Telkohmba of the Sinhalese and Veppamram of the Tamils, we believe) We have a specimen in our garden at Turret Road, which got so hacked, through native neighbours begging pieces of the bark or branches and leaves (as medicine) that we had to forbid access to it for a time. The tree is common in the Northern forests where Mr. Dyke found it to be indigenous. Balfour's "Cyclopædia" tells us :—

"In appearance the wood is much like mahogany, and is used by the natives for general purposes. Its bark is bitter, is considered a valuable tonic, and has been tried by European physicians with a success nearly equivalent to what might have been expected from cinchona bark. Oil is obtained from the seeds by either expression or boiling, and is much used medicinally. The fruit is not unlike a small French olive in size and appearance. The oil is of a deep yellow colour, has a strong smell and an unpleasant bitter taste ; is much esteemed by native doctors as a warm medicine, as an external application in foul ulcers, and as a liniment in rheumatic and spasmodic affections, etc. It is frequently burnt in lamps, and is sold in the bazaar under the name of bitter oil, also black oil. Dr Maxwell found this oil equally efficacious to cod-liver oil in cases of consumption and scrofula. He began with half-ounce doses, morning and evening, which were gradually reduced. Margosa, as well as illipoo oil, mixed with an equal quantity of cold-drawn castor-oil, produces a hard vegetable wax of an agreeable roseate colour. The leaves of the genera Melia and Azadirachta, dried and kept in books, are much used by the people of India to preserve furs, feathers, books, papers, and clothes that are lodged in trunks, book cases, etc., from the attacks of insects. It is useful to place along with them small packets of camphor, or little cups of camphor dissolved in alcohol."

Dr. Geo. Watt has much to say of the tree, but we need quote only one passage :—

"The *nim* tree is generally supposed by its presence to materially improve the health of a neighbourhood. Believed to be a prophylactic against malarial fever, and even against cholera, it is frequently planted near buildings and villages. Even Europeans believe in this property to some considerable extent, especially in the North-West Provinces and Oudh, and villages surrounded with *nim* trees are frequently cited as proverbially free from fever, when neighbouring villages suffer severely. It is extremely doubtful, however, whether this tree exercises a beneficial effect to a greater extent than any other."

THE SWEET CASSAVA.

According to a communication from the President of the Chamber of Agriculture at Pondicherry, published in the *Journal d' Agriculture Tropicale*, the cultivation of Cassava is an important industry in the whole of Southern India. It is a very remunerative one, with very little risk attaching to it. The variety cultivated in French India is the sweet Cassava, which adapts itself to all varieties of soil, but prefers a sandy, slightly clayish soil to a heavy one. Generally speaking, the cultivation is carried on in land that can be irrigated, and, indeed, it is only in such cases that cultivation can be advantageously carried on at all. The Cassava plant takes ten months to arrive at maturity, and during a period of drought from five to six processes of irrigation every month are necessary. The system of drying the roots to preserve them is not adopted in Pondicherry. Cassava, cultivated under good conditions with good manure, gives from three to four pounds of roots per plant, and is sold at the rate of 60 rupees per candy of 240 kilogs (528 lb.) on the field. The President of the Chamber of Agriculture thinks that, if a factory for the manufacture of "fecula" were installed in Pondicherry, the production would increase so as to supply several millions of tons per annum, as from 2,500 to 3,000 plants can be planted in a hectare (2·47 acres).—*Friend of India.*

PLANTING NOTES.

PHOSPHATES IN TEA SOIL.—Mr. John Hughes bears out, in his letter published elsewhere, the view taken by Mr. Mann and generally established, of the necessity for the presence of phosphates in tea soil, the best tea being richest in phosphoric acid. We have already quoted largely from Mr. Mann's most useful booklet, the tea soils of Assam.

Mexico."—There is a proper in the *Forum*, by Professor Reinsch, entitled "A New Era in Mexico." The article deals with the agricultural and commercial resources of the country, and its value as a field for capital. Mr. Reinsch expects that the next decade will witness great progress in Mexico's industrial life, and thinks that the political and legal conditions of the country give fair security for investors. Most of Mexico's commerce is in the hands of foreigners—Germans, French, and Spanish, while the largest banks are managed by British capitalists. The development of the tropical agricultural belt is one of the great opportunities of the country, land being cheap, and coffee, sugar, and rubber being easily grown. The labour question is the great difficulty, as the natives are shiftless and unintelligent. At present Chinese coolies have to be imported. Mexico, however, is not a land for the investor with small means, as expensive machinery is needed to prepare most of her products for the market.

THE ANNAMALAI PLANTERS—have been favoured with a visit from Lord Ampthill, the present Governor, at an early stage of his administration. The bulk of their address to His Excellency, together with the essential portion of the Governor's reply, appear in our daily and *T.A.*

"CRYSTALLINE LIMESTONES OF CEYLON."—The abstract of what is evidently an able geological paper on the above subject by Mr. A. K. Coomara Swamy, B. SC., F.L.S., F. G. S., will be found on page 759. It was read before the London Geological Society on March 12th, the veteran Sir Archibald Geikie, F.R.S, being in the chair, while an interesting discussion followed in which Mr. Parkinson (also recently in Ceylon on a geological visit), Mr, Holland, Prof. Judd and Mr. Greenly took part. It is curious and interesting to find comparisons made between our limestones and those near Loch Maree and at other parts of the North-west coast of Scotland.

WATTLE BARK.—South Australian wattle bark has always held a high place in the market for tanning materials. Until prices became greatly reduced some ten years ago, large quantities were stripped and exported. For a long period the industry in South Australia has been depressed, but of late better values have induced greater activity, giving employment to numbers of strippers, and a welcome contribution to the farmers' income and to our staple exports. Plantations have been formed successfully, and more steam grinding mills have been erected, employing many hands. The quantity of bark stripped was 8,330 tons compared with 8,038 tons in the previous year, and 3,131 tons in 1892-3. The quantity exported in 1900 was 8,386 tons, value £63,732; in 1899, 8,953 tons, value £69,985, against 8,206 tons value £62,132, in the previous year. During the decade 1891-1900, shipments amounted to 60,166 tons (the value being £478,433), of which 21,586 tons (valued at £191,237) were exported during the first, and 38,580 tons (value £287,196) during the second five years of the period.—*B. Trade Journal.*

GAME PROTECTION SOCIETY OF CEYLON.—Our columns are largely filled with the annual meeting of this Society at Nuwara Eliya last month and it will be seen that the Society is very much alive, although some complaint is made on the score of insufficient monetary support. Mr. Farr's report is a record one and will provide interesting reading to many sportsmen desirous of putting themselves *au fait* with current sport in Ceylon. We are inclined to support the appeal to sportsmen to do their duty by the Society and avoid the lapse of the protection of game entirely into the hands of Government. The announcement is made that a new sanctuary is to be formed in the Puttalam district; news which should be welcome to all huntsmen. One district which needs attention is that of Trincomalee where our military friends do most of their shooting, but unfortunately do not too well consider the claims of the Game Protection Society. It was natural that the shooting of the rogue elephant at the Kraal should not go unnoticed and the secretary, in general terms, condemns the episode; though "inexperienced sportsmen," a somewhat strong term, perhaps, is used to include the gentlemen who undertook the shooting. These are the main points in the report, but it will be seen that a good deal of discussion followed for which we direct our readers elsewhere.

PROSPECT OF PEARL FISHERIES.

It is reassuring to learn that Capt. Donnan with his great experience has found no reason during his recent visit, to alter his expectation of a series of three or four successful Pearl oyster fisheries beginning, say in 1905. Of course, it is impossible to make sure until the oysters are older—indeed until the very season of the fishery—but it is very much in accordance with the past history of our Fisheries that there should now be a successful resumption after so many blank years.

This is, of course, entirely apart from what may come of Professor Herdman's Inquiry and experiments. One proposal arising out of the latter is the transplanting of young oysters from a fully occupied, or even overcrowded Bank, to another Bank not far off where the ground is quite clear. But the difficulties in the way of successful transplanting and culture in this way are we believe, considered by Sir Wm. Twynam and Capt. Donnan to be very great indeedl Still, there can be no harm in a trial, native divers and their boats being utilised. As by 1905, the Colombo Harbor and Dock works should be all completed and with a Port Trust in full sway, the Master Attendant or Port Officer will be one of the busiest officials in the place—not likely to be spared to go after the superintendence of a Pearl Fishery, however important. It may, therefore, be a question to be considered when the day approaches as to whether Capt. Donnan should not be induced to re-visit the East and give two months' special service to the first Pearl Oyster Fishery since 1891?

THE EXPERIMENTAL FARM AND GARDEN AT GANGAROOWA.

We are pleased to learn that this latest experiment on the part of the Government is now fully entered upon. The purchase was effected (through the good offices of Mr. T. H. Huxley) to the satisfaction of all concerned:—the Horsford family, Mr. E. Jeffries (who is shortly leaving the island) and Government. Mr. Herbert Wright, as Assistant to Mr. Willis, has entered on the charge of Gangaroowa; and we are glad to learn that this hard-working officer has made a specially good impression on all planters with whom he has come into contact, for his practical good sense, as well as scientific knowledge and personal energy. We trust Gangaroowa Experimental Station will prove a great success.

RICE LANDS AS INVESTMENT,

[What do Ceylon experts say to this?—Ed. *T.A.*]

The splendid crops of the past few years have drawn a considerable amount of attention to the value of rice lands in Texas and Louisiana. Many years ago rice was cultivated on the great prairie stretching between St. Mary and the Texas line; but as it was treated entirely by Oriental methods, the returns were so poor that the crop was considered hardly worthy of attention. In years of drought, especially, the cultivation was liable to total loss, and after a few dry seasons the area under rice fell to almost insignificant proportions.

Some fifteen years ago farmers from the North-West began to pay more serious attention to rice, and more scientific and modern methods were adopted. Irrigation was properly undertaken and proper plant and machinery erected. The experimental stage has now long been passed, and today there is something like $20,000,000 invested in the cultivation of 400,000 acres.

Careful comparative tests have proved that a grower can raise a larger yield in Louisiana and Texas than in any other part of the world, even China and Japan, noted as these countries are for rice-growing. It is an actual fact that where the Japanese grower can cultivate half an acre at a cost of from $10 to $18 per year, the planter in South-Western Louisiana or Texas can raise a crop of 80 acres at a cost of from $180 to $216 per year; consequently, he can raise 160 times the product of a Japanese grower, even though he pays from eighteen to twenty times the amount for labour.

The cost per acre of the various operations connected with the raising of the cereal in Texas has been carefully estimated as follows:—

	Per acre.		Per acre.
Ploughing sod ..	$2 00	Brought forward	$8·25
Discing twice ...	1·00	Water ...	6·00
Harrowing twice...	1·00	Cutting ...	2·00
Seeding ..	0·50	Shocking ..	0·50
Constructing levees	0·50	Sacks ...	1·00
Seed ..	3·30	Threshing ...	1·00
Tendering levees	0·25	Hauling to warehouse.	0·50
Carried forward ...	$8.25		$19·25

An average rice crop produces 10 sacks per acre. A sack contains from 160 lb. to 210 lb., averaging about 180 lb. or about 11 barrels to the acre.

Average market price per barrel ..	$3·25
Eleven barrels, at $3·25	$35·75
Less cost of production	$19·25
Net income per acre	$16·50

Assuming the cost of land (improved) at $30 to $35 per acre, interest on the investment works out at 50 per cent. The crop is a very certain one, the cereal being easier to raise than oats or wheat. It should also be remembered that the rice itself is but one product of the crop. Taking an average barrel of Texas rice, it is found that it will produce 40 lb. of the highest grade, 25 lb. of head rice (the second quality,) 25 lb. of screenings, and 10 lb. of grain suitable for brewers' use. Every portion of it is available, even the chaff, which is burned as fuel in the mill.—*H and C Mail*, March 28.

BRAZIL AND ITS AGRICULTURAL CRISIS.

The Rev Joseph Orton writes to us from the province of Rio de Janeiro on the subject of British trade in Brazil. We give the following extracts from his letter:—"It is true that at the present time the country is in the throes of the most serious agricultural and commercial crisis it has ever known, due to the fall of prices in the coffee, sugar, and india-rubber markets; but this is a temporary state of things, and the country will soon resume its true nature as an earthly paradise. With this preliminary I will point out three methods by which British trade can benefit itself,

and at the same time be a help to the country:—1. Iron bridge-building.—There is an immense field over nearly the whole of the country for bridges, strong, well-built, safely set, and cheap. A good firm in this line, turning out quickly well-made and cheap work, having its central office in Rio, and houses in the capitals of the different States, would be able to make a good trade. Tropical floods are very disastrous for the wooden bridges commonly in use, and numerous accidents happen through the planks getting rotten. The financial consideration in wooden bridges is that they are cheap. 2. Mineral mining.—At present English mining companies in Brazil confine themselves almost exclusively to that of gold. The country, especially the States of Minas Geraes and Bahia, is, however, so rich in nearly all kinds of minerals, untouched, that there is here a vast field for capital, which, well managed, would bring in good returns. 3. Timber forest exploring.—The three States of Para, Amazonas, and Matto Grosso have thousands of miles of virgin forest timber, for which a market is urgently needed. . . . Since agriculture, sooner or later, will make inroads, and therefore these forests have to come to an end, the best thing to be done is to start companies that could put these timbers on the English market. . . . The three timber-covered States just mentioned have particular advantages for the timber trade, since deep rivers form a complete network all over them, thus obviating heavy road expenses. The lower reaches of the river sides could only be worked six months of the year, owing to floods; but the higher reaches could be worked the whole year."—London *Times*, March 24.

MINERALS AND OIL IN PERSIA.

On Persian soil there are many undeveloped treasures. There are numerous large petroleum fields in the country, not one of which is worked to any extent, much less in a systematic way. The petroleum fields in the provinces of Nazanderan, Gilon, Chamsee, Kerman Lauriston, and Arabistan are hardly touched, and render no profits worth mentioning. In those mountainous regions naphtha is also said to exist in considerable quantities. According to Consul-General Hughes experts on this subject believe that the two cities, Sohab and Schuster, would serve best as central stations from which to work the fields. Sohab can easily be connected with the Dijalah River by means of a navigable canal, by a narrow gauge railway or by pipe lines, so that the oil could be conveyed *via* the Dijalah and Tigris rivers to Mohammere without heavy freights. From there it would have to be transported by special vessels to India, Egypt, China, and Europe. The natural transportation route from Schuschter is along the course of the River Karun. The environs of Schuschter are particularly rich in petroleum and naphtha. At present nearly all the petroleum consumed in Asia and Africa (particularly in Japan China, India, and Egypt), is furnished by the wells of Baku and Pennsylvania. Persian Petroleum with less cost for freight could, it is said, doubtless compete successfully in neighbouring countries. The rich Persian coal veins are not properly appreciated. They cover wide regions, and are worked in a very primitive way. There can be no doubt that, if vertical and horizontal shafts were driven into the veins, and the water pumped out, quantities of good coal could be brought to the surface. The Persians dig unsupported shafts not more than 20 or 30 feet deep, and abandon them as soon as water makes the work difficult, re-opening the vein at another spot. Only the surface coal is utilised. Copper, argentiferous lead, iron ore, arsenic, sulphur, cobalt, antimony, borax, tin and other minerals are also found in large quantities in the Persian mountain districts. All these resources must remain undeveloped so long as Persia possesses no transportation facilities. Even the well-known turquoise pits of Persia, the most important of which are those of Nishapur, in the Province of Khorassan, yield so far very little good material, owing to the fact that they are owned by natives who cannot work them by the modern system.—*Journal of the Society of Arts*, February 7.

THE PAPER MULBERRY IN JAPAN.

The Government of India have made sporadic efforts to cultivate the Paper Mulberry (*Broussonetia papyrifera*) tree in this country without much success, as far as we were aware, from an economic point of view, though the tree has been found to grow well enough in several parts of this country. It may interest our Government officials to know to what varied uses the Japanese put the bark of this plant. We quote below an extract from an informing lecture delivered by Dr. H. Kempte before the Society of Dyers and Colorists, Bradford, last November, and which appears in the *Journal* of that Society for January, 1902. Dr. Kempte said:—

"Permit me to say a few words about Japanese paper in general and about the making of these paper stencils in particular. This wonderful paper with its admirable strength is made of the bast of the Paper Mulberry tree (*Morus papyrifera*), originally a Chinese plant, which is now cultivated all over China and Japan. A mulberry plantation resembles very much a grove of our willow trees, the mulberry having a very short thick stem with many branches. In November, when all the important products, such as tea, rice, beans, etc., have been harvested, the Japanese farmer finds time to cut the branches of the mulberry tree. The first operation is to boil these branches in a weak wood-ash bath in order to loosen the outer layer of bark. After the latter is removed, the bast is peeled off and thoroughly washed by suspending it in the river. The bast is then dried and sold to the papermaker In our paper mills the pulp is prepared by grinding almost any fibrous material in the beating machine until sufficiently fine, whereby it cannot be avoided that the fibres are cut short. The Japanese, on the contrary, are very particular about treating the mulberry bast in such a way that the fibres retain as much as possible their original length, and this, of course, is the reason for the excellent strength of their paper. The bast is placed on a flat and level granite stone, moistened with water and beaten with wooden hammers until thoroughly fine. The paper is, of course, made by hand, and by shaking the sieve only in one direction, which is almost the rule in Japan, the fibres place themselves nearly parallel. This accounts for the fact that the Japanese paper can only be torn straight in one direction, at the same time possessing a remarkable strength in this direction.

"In China and Japan paper is a far more important and far more generally used article than with us, owing to its superior quality and strength. The Japanese always has a supply of paper sheets in his sleeve pocket. If he has to wipe his nose he does so with a sheet of paper. If he wants a bit of string he twists a strip of paper together. I have had an opportunity in the railway carriage of seeing a Japanese do almost the impossible with a bit of paper string, such as tying up his trunk with the remains of a letter. In Japan, paper not only takes the place of

our window glass, but even of our doors and walls. Considering that the climate in the provinces north of Tokio is colder in winter than in England, and that the Japanese have no stoves, only some burning charcoal in the *hibachi*, a kind of brasier, you will understand how little at home the European traveller feels under such circumstances. I had exactly twelve months ago, when I was in Nagaoka and Nigata, to suffer very much from these primitive arrangements.

"If the Japanese or Chinese paper is impregnated with Ye-no-abura, the oil from *Perilla ocymoides*, the Japanese substitute for boiled linseed oil, it becomes perfectly waterproof. It is used for making umbrellas and macintoshes. Perhaps it will interest you to know that during my stay in Japan I never had an umbrella or a macintosh. If it happened that I was caught by a sudden shower, and this happened very frequently indeed, I went into the nearest paper shop and bought a macintosh of oil paper for 2d (8 sen). The same with umbrellas. If the paper is oiled and varnished, then it takes the place of leather; the roofing of the jinrickshas, the little hand carriages, is often made of paper, even the Japanese "tab" for rainy weather, the equivalent for our water boots, are made of paper.

"As the paper for the stencils as used in cotton and muslin printing must stand a good deal of handling, moisture, and chemicals, it is treated specially for this purpose. A very long fibrous paper, made of unbleached mulberry-bast, is impregnated with "shibu," which is an astringent milky extract the Kaki fruit, *Diospyros kaki*. This extract has the properties of varnish, it dries in the air, stiffens the paper, and makes it very resistant to water.

"The cutting of these stencils is a special industry. It is mostly done by hand; at the most, the stencil cutter prints the outlines on the paper before cuting it."

Dr Kempte called the Paper Mulberry tree *Morus papyrifera*. Its present name is *Broussonetia paptrifera*. It is closely allied to the ordinary Mulberry, and belongs to the Natural Order *Morlceæ*. It grows wild in China and Japan and also in many of the islands of the Pacific Ocean, where the natives manufacture a large part of their clothing from its bark. It forms a small tree, attaining about twenty or thirty feet high, with a trunk seldom more than a foot in diameter, and generally branching at a short distance from the ground. The young branches are covered with short soft hairs. The Japanese cultivate this plant very much in the same way that we grow osiers, and they use only the young shoots for the manufacture of paper; these are cut into conveniently sized pieces, and boiled until the bark separates readily from the wood, when it is peeled off and dried for future use. To convert this bark into paper, they proceed in the following manner:—The dried bark is first moistened by soaking for a few hours in water; all superfluous matter is then removed by scraping with a knife, after which the bark is boiled in a ley of wood ashes until its fibres are thoroughly separated, when it is reduced to a pulp by beating with wooden batons; this pulp is then mixed with mucilage and spread upon frames made of rushes. The paper thus made is of a whitey-brown colour, and very strong; it is in common use in Japan. Instead of paper, the natives of the South Sea Islands manufacture from this bark an exceedingly tough cloth, called *tapa* or *kapa* cloth, which they commonly use for clothing, either plain or printed, and dyed of various colors. This cloth is principally made by the women, who adopt the following method of manufacture:—The bark is first softened by being soaked in water for a considerable length of time; it is then placed upon a log of wood and beaten out with a baton until it is of the requisite degree of fineness. The baton is made of very hard wood, and has four flat sides, each of which is sharply ribbed. Two or four women usually work together, and as they keep time in beating, the noise they make is loud and musical. In some islands, however, another and inferior method is adopted, the bark being placed upon a flat board and scraped with different kinds of sharp-edged shells while kept constantly wet. By employing mucilage obtained from the arrowroot, the natives join pieces of cloth together, and Admiral Sir Everard Howe states that the King of Tongataboo (one of the friendly Islands) had a piece made which was two miles long and 120 feet wide.—*Indian Gardening and Planting.*

EGYPT FIFTY YEARS HENCE.

This was the subject of the lecture which Mr Willcocks gave at the meeting of the Khedivial Geographical Society in the hall of the mixed Tribunals on Saturday afternoon.

The endeavour to pierce the veil which clouds the future is an unsatisfactory task however one may contemplate it. But few of those who listened to Mr Willcocks's glowing description of the Egypt of the future will be alive 50 years hence to bear witness to the value of his predictions, and none we may perhaps say present were so qualified as the lecturer to judge of the possibilities of the country. Mr Willcocks, besides being endowed by nature with a vivid imagination, has an almost unrivalled knowledge of Egypt, and especially of its capabilities under a perfected system of perennial irrigation. Mr Willcocks foresees an Egypt in which

IRRIGATION WORKS

will have been laid out with a most lavish hand. Dams and weirs at the Ripon Falls, where the Nile leaves the Victoria Nyanza Lake, at Fabougo south of Wadelai, at Senaar, at Abou Harez, at a point near Esna, at Keneh, at Sohag, and at the mouth of the Nile, come within the sanguine view of Mr Willcocks's imagination. Apart from these expensive works all the canals which are to provide flush irrigation to the Meroe and Senaar peninsulas, to a district of 150,000 feddans at Kom Ombos, to 400,000 feddans in the Fayoum, have to be constructed. Dykes will be made to provide an escape for excessive floods, and, most expensive of all perhaps, a Ministry of Agriculture with bureaux to deal with forecasting the weather, animal industry, chemistry, soils, forestry, experimental stations, foreign products, foreign markets, pisciculture, statistics. It is true that every new irrigation work pays for itself within a comparatively short number of years, but we cannot seriously consider that the country could possibly digest such an enormous programme within 50 years.

Mr Willcocks foresees the permission of the

TOBACCO CULTIVATION

and draws a striking picture of the fellah discoursing upon the qualities of his home-grown tobacco beneath the shade of his date palms and vines. Khartoum is to be one of the greatest cities of Africa, the centre of trade through which the products of the Meroe and Senaar peninsulas, the New Egypt, will pass by railway. The extensive marshes of the Bahr el Ghazal are to be drained and the White Nile confined within its banks and this large district will be cultivated with rice and the Indian water nut. The rivers will furnish water-power whereby electricity will be furnished to supply power for innumerable factories and for railway locomotion. Those factories, run by the power obtained from the Ripon Falls, will be employed in

GRINDING THE DRIED BANANA fruit, which forms, according to Mr. Willcocks, a most nutritious diet. The Wady Ryan is to be used as a basin for the escape of an excessive flood and is to become a fashionable inland sea resort. The Nile-bed itself is to be looked after, and by the help of spurs, etc., the river will be navigable from Cairo to Assouan and in Mr. Willcocks's mind, will be covered with the pleasure boats of tourists who will flock to Egypt then as they do to Switzerland now.

—*Egyptian Gazette*, March 17.

PRODUCE AND PLANTING.

The handling and distributing of tea after it is produced, by those who know their business, is, as we have frequently pointed out, more profitable than growing it. The distributing firms play an important part in popularising tea both at home and abroad; and some of them have rendered good service to India and Ceylon in this respect. The wholesale tea trade has become a vastly important business of recent years, and has developed on broader lines since the rise of the Indian and Ceylon tea industries. Some of the old advertising firms of the days of China tea have either dropped out or restricted their operations, while other enterprising people of more recent times have launched out with vigour, and have reason to feel well satisfied with the result. A history of the tea trade to date, with the story of the rise of the large distributing concerns, whose expansion seems to know no limits, would be interesting reading. The Mazawattee Company, with their huge tea and cocoa business, afford a remarkable example of the fruits of judicious enterprise, and there are other firms the history of whose rise and progress borders on the romantic side of things commercial. The successes of the planter on the other hand, at any rate of recent years, do not seem to offer any striking examples of the reward which should attend merit. He suffers both from pin pricks and more poignant wounds, and finds it difficult to develop at all, because if he should do so he will be accused of over-production. He hopes for better days, but doubts if he will ever loom very large in the chronicles of those who write the history of millionaires and how they made their money, except at secondhand.—*Home and Colonial Mail*, March 28.

GREEN TEAS AND—GREEN TEAS.

We are disappointed with Mr. Drummond Deane. It is very natural, and only to be expected, that he should stand up for his own make of "green teas" and the more he tells us about his plans, his new invention and the appreciation felt for his samples or samples made according to his system the better pleased we are. But why in the world he should drag in the "American Commissioner" into a discussion over different makes of green tea, puzzles us in the extreme. We can see no more connection than between the proverbial "Goodwin Sands and Tenterden steeple." Indeed this diversion looks like a "red herring drawn across the scent." As if, conscious of a weak, case notwithstanding all he had written, Mr. Deane in conclusion, wished the planters of Ceylon to understand:—"I and the old school of green tea makers are working according to your official American advices, while the *Observer* is backing-up a new-fangled system which is calculated to discredit your representative in America,—therefore, on the personal question if on no other, I claim your support"! Now any such argument is a simple absurdity. In the first place—though we do not usually reveal secrets of the sanctum—the senior editor (who was the subject of such virulent attacks from the American Commissioner as showed the latter to be unfit for his semi-official position) has not hitherto written on the subject of "green teas" at all. (He has had a very busy three months chiefly with book work, for home as well as local publication.) This may possibly at once dissipate Mr. Drummond Deane's suspicions. But a little reflection should show any impartial reader how utterly far-fetched and ungrounded such suspicions are. Our coadjutor had his information at first hand from Mr. Galt; but he also had it corroborated by the recognised agents of the Planters' Association (the employers and patrons of the Commissioner) and if ever therefore an editor was justified in thinking he was writing for the benefit of the tea-planting industry as a whole, and in accordance with the views of the Commissioner, it must have been in the present case, although, sufficient allowance was not made for the need of continuing the estate manufacture at any rate until it was seen how the superior "greens" meet the requirements of the American trade and what prices they realize. It is a fact that Mr. Wm. Mackenzie advised that Ceylon planters should turn their attention to "green teas" almost from the first day he went to America, though his information was far from being as full on this point as it might have been. Now green teas to suit the people of the United States, we are bound to believe—until the contrary is proved to us—must be teas much more after Mr. Galt's, than Mr. Drummond Deane's, system if we are to accept the local report of experts who have seen and tasted both.

Let us, however, come to closer quarters with Mr. Drummond Deane. By what right, or on what authority, does he assume that the teas made under Mr. Galt's direction—and on the system which will be continued by his trained Chinamen at Ambewatte Mills—*are or need to be artificially colored?* He might just as well assume that teas made on Brunswick, or any other estate, are colored. We of the *Observer* have always dwelt on the supreme importance of Ceylon supplying "pure teas" and what said Messrs. Forbes and Walker in their Report on Mr. Galt's teas:—"*the crowning point being their purity and freedom from scum or colouring matter*" and the same Broking firm were very careful in their comparison with estate-made greens, thus:—"Green teas now being made in the various factories of Ceylon are generally speaking *sound and good, particularly in cup*;

but they are undoubtedly at a disadvantage as regards appearance of leaf when compared with China Greens." But says Mr. Drummond Deane, "this is merely the opinion of a Broker, not a Buyer." It is an expert's opinion and we have always thought that buyers paid special attention to such reports. At the same time it may console our correspondent and other critics—who have thought that in making known Mr. Galt's special success (basing our opinion on the expert Broker's report) we were giving an unnecessary advertisement to the new process,—that it is not at all the wish of its promoters to see the ordinary factory preparation of "green tea" cease. On the contrary, we believe, the owners of Ambewatte Mills are considerable purchasers of our ordinary "green teas," the bonus, however, in such cases falling to the estates from which they come. Nor will such teas be shut out from the American—and especially the Canadian market—so long as they can be supplied cheaply. They are most useful for various purposes we are told, chiefly for "mixing"; and in this connection we would ask the "Thirty Committee," if they can say, or can procure the information, as to how much, approximately, of the Ceylon "green tea" shipped last year, got into *direct consumption*? Our object is to get reliable information on all points connected with the subject; but by no means to discourage estates which have been making "Ceylon greens" from continuing their work so long as the bonus is available. The more "greens" of all kinds made, the less leaf there will be for black tea. At the same time there is undoubtedly one risk to be borne in mind, namely, that American buyers may get it into their heads in some cases, that the low-priced "Ceylon greens' which we are told they use chiefly for blending with higher-priced and therefore presumably better teas from China or Japan in order to reduce the price of the latter?) are the best we can do in this island in respect of green tea. It is surely an advantage if Mr. Galt and Ambewatte Mills (according to the P. A. Brokers' report) are to show them how mistaken they would be in adopting this opinion?

At the same time, let us do justice to the local enterprise in "greens" so far as it has gone. In our editorial of the 7th instant, a mistake was certainly made when it was stated that "the progress made has been slow and small." Considering the circumstances, the figures work out very satisfactorily on the whole. In 1900, bonus was paid on 472,291 lb.; in 1901 on 1,589,929 lb.; and this year the prospect is of the latter figures being doubled,—indeed at the present moment, it is estimated that 400,000 lb. "greens" per month are being turned out from Estate factories. From the Ambewatte Mills as a present maximum, the outturn could not exceed 2,000,000 lb. a year, and it would make very little difference in the price obtained for this superior kind, if the manufacture of 3,000,000 lb. of ordinary "Ceylon Greens" were stopped, for, the true competition is with Japan and China "Greens." On the other hand, Mr. Galt believes, if his Ceylon made green tea take as he expects in America that the Japan trade in this article with the Western Continent will disappear in about six years. No doubt, Mr. Galt includes all the green tea from Ceylon as helping to this end; for, whether for blending or other purposes, there can be no doubt that the produce hitherto shipped has been affecting imports from Japan into Canada as shewn by our correspondent signing "A Friend of all Green Tea," whose letter adds a good deal to our information and offers some needful corrections on our previous remarks without any unworthy insinuation.

To sum up, it seems to us that the great importance of Mr. Galt's improved process is that by its means a green tea is turned out that can obtain a price in the United States sufficient, even with the extra cost, to make it independent of the local bonus; whereas the profit on most of the factory-made teas would seem at present, to be due to that bonus? Of course, so long as a bonus is available, all "green" tea made will be entitled to share in it. Be that as it may, we can see no reason —basing our opinion on the expert report of Messrs Forbes and Walker—to doubt the superiority of Mr Galt's system, and while wishing well to all 'Ceylon green teas' we should be especially proud of a product that is likely to hold its own with the very best make of Japan or China greens.

A FRENCH REVIEW OF THE CEYLON HANDBOOK AND DIRECTORY.

HIGH APPRECIATION OF THE AGRICULTURAL AND PLANTING REVIEW.

From the *Journal D'Agriculture Tropicale* we give a translation of part of a review of our "Handbook," etc., as follows:—

This big volume frightens one by its very richness; it is stuffed full. But once having expressed a reservation as to its over-fulness, we do not hesitate to declare that this Ceylon annual is a work of prime value and that it should not be wanting in any Colonial Library.

Leaving aside the Directory and whatever concerns purely local interests, we would emphasize particularly the chapters entitled "Review of the Agricultural and Planting Industries of Ceylon." It occupies with the allied statistics more than 200 pages and deserves the highest praise for the critical spirit, the accuracy and the earnestness or seriousness which characterise the author's work. It is not all at once that one comes to establish such a monument of research and patience. The first review of this kind was published in 1877. Since then the work has been renewed in 1881, 1883, 1885, 1888, 1890, 1891, 1893, 1895, 1898 and finally in May 1901.

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* J. Ferguson, Ceylon Handbook and Directory, 1901. In 8° 1780 pages, imprimées en très petits caractères. Chez FERGUSON à Colombo, et chez tous les agents du "Tropical Agriculturist,"

The author gives in succession the history and the statistics of all the great planting industries of the island; he also draws up a summary of all the efforts at introducing new products, attempted whether by private persons or public institutions. Each paragraph closes with a rapid glance at rival countries and their produce or output. One also finds numerous bibliographic indications and suggestions.

In most cases, the documents quoted or referred to, whether in the text or in a note, appeared first in the *Tropical Agriculturist* and Mr. Ferguson never fails to emphasise the fact with legitimate pride. Some of the paragraphs, which thus set forth the planting industries which have made the prosperity of Ceylon, are truly most remarkable; nothing of the kind could possibly be better done. We shall, perhaps, some day be able to give a more complete idea of the way in which Mr. Ferguson publishes in his journal a translation of articles concerning various cultivations of particular interest for the foreigner.

One must also take note of the commercial studies and World's Statistics of the different great agricultural products; this chapter forms a sort of complement to the preceding one; the list of the authorities consulted for the review, quoted on page 184j, gives some idea of the enormous labour involved in collecting all these figures.

The volume contains also, like its predecessor, a list of Ceylon patents (pages 369-372). This will be invaluable for inventors of all countries who have to do with machinery for tea or other tropical products as well as for anyone interested in tools used on plantations.

Between the Tariff of Batta or Allowances to Witnesses and Jurors and the legislation relating to coolies there is an excellent Report on Ceylon Woods and their adaptability for Tea Chests. Also, some hundreds of pages further on, comes a General List of Ceylon Woods, inserted just before a very useful little study on the Coconut Oil Trade from 1860 to 1901.

THE PLANTING INDUSTRY AND THE PEOPLE OF INDIA.

[The following appears in the London *Times* of March 29th.—ED. *T.A.*]

(To the Editor of the *Times*.)

Sir,—Will you allow me to mention one fact, overlooked by the recent tea-planting deputation to Sir M. Hicks-Beach, that is calculated to give the Government and people of the United Kingdom a greater interest in the planting industry of India and Ceylon than anything hitherto advanced? It is that every acre opened by British capitalists in tea, coffee cacao, &c., means the support, directly or indirectly, of not fewer than five native men, women, and children. Tea alone affords, therefore, a livelihood to between $4\frac{1}{2}$ and 5 millions of the people in India and Ceylon (almost entirely India, because the latter drawn its estate coolies from Southern India). This should afford the best justification for the Viceroy and the Governor of Ceylon deprecating an increase in the tea duty, which would inevitably result in a great many acres being thrown out of cultivation. The Secretary of State for India and his advisers should specially note this fact.—Truly yours,

J. FERGUSON, of the *Ceylon Observer* and *Tropical Agriculturist.*

Colombo, March 6.

INDIARUBBER IN NATAL.

ITS CULTIVATION AND PRODUCTION.

BY ANTHONY WILKINSON IN THE "NATAL AGRICULTURAL JOURNAL."

Some years ago I tried the experiment of planting an acre of "Manihot Glaziovii, or the Ceara rubber tree of South Ameria. Mr. Medley Woo', curator of the Durban Botanic Gardens, was kind enough to furnish me with roots and cuttings of Ceara from trees he had growing in the Gardens, and wished me to try an experiment on a larger scale. I planted an acre of Manihot with coffee plants between. The rubber trees grew well and seeded abundantly, and at four years old, when the trees got to a good size, 4 to 5 inches in diameter, on scoring the bark to extract the rubber, although the rubber was of good quality and very elastic, the collecting or getting of it was slow and costly. Accordingly, I came to the conclusion that the experiment would not pay, unless the trees could be tapped and the juice collected in quantity, as is done in South America, and further that Natal was not sufficiently tropical to make good flow of sap. Coming to these conclusions I cut the trees down, but still the trees come up again from the seeds every year, and grow luxuriantly 5 or 6 feet high in the first year, showing the climate to be suitable for their growth. Among my coffee I have a self-sown Ceara only three years old, and over 20 feet high. The red sandy soil of the coast such as that of Berea, Durban, would be the most suitable. The seeds left to mature do not come up for a year or two. By some, filing is recommended, but this is a tedious process; tapping them with a small hammer until they crack serves as well, and is much quicker. The plan adopted to collect the rubber, with the Ceara rubber trees, is to strip off the thin outer bark, which is like brown paper, and expose the green bark. This inner bark is then scored across with a knife at an angle, and the milky juice or sap then exudes and dries on in an hour or two, and can be peeled off and wound up in balls, but the process is so slow with the coolie women employed at 6d per day that I found it would cost about 5s per pound for the labour of collecting, and the product would be worth only about 2s per pound. Now it strikes me very forcibly that, if a cheaper way of extracting the rubber were adopted, it would pay well. The rubber is there, of good quality, but the question is how to get it out. My idea is this: to plant the trees in rows, 12 or more feet apart, like large hedges, and at two or three years old, when large enough, in the spring or early summer, when the sap is rising, to slash off the small branches and leaves, and crush them in a small steam sugar-mill, and let the juice run into a tank of water. The residue of branches and leaves would then be put into a hydraulic press, with steam outside, and pressed as long as the sap would flow. The rubber juice would coagulate in the water, and rubber raked out and squeezed by hand into balls and dried. By this method the trees would be pollared and dwarfed, and could be cut and trimmed once or

twice a year, as found advisable. It would be necessary to keep the land well-ploughed and scarified between the rows, for all would depend on the cultivation received. The rows, if in hilly land, would require to be run on the level, so as to cultivate cheaply with horses or mules. There are several other plants which would give good rubber, if treated in this manner and well cultivated. The Beaumantia, a white-flowering creeper of the order "Apocynaceæ," the Borneo rubber creeper, grows well here in Natal, and I have no doubt many native plants would be found to produce good rubber. If this plan of extracting rubber from the plants were found to answer, it would revolutionise the rubber trade in a few years, and rubber could be grown to any extent, like sugar. Moreover, the supply of rubber, owing to the destruction of the trees, is decreasing, whilst the demand for the article, which is now being applied to so many different purposes, is steadily increasing, and therefore there is no fear of the market being over-stocked. India-rubber being so valuable an article, worth £200 to £300 a ton, there is a lage margin for profit. For an energetic young man wanting something to do and to try a new industry, I would recommend it, but remember the old American sage's saying: "Be sure you are right, then go ahead." I feel pretty sure there is money in it.

Mr. James Gregson, writing in the same journal with reference to a former and more enthusiastic article, says:—"In 1895 and 1896 I had Natal rubber offered me repeatedly at 1s 8d per lb., but I always thought it too dear at the price. I remember Para rubber going up to 4s 9d per lb. just before the Baring Bank failure; and at that time there was some splendid Madagascar rubber on the market, for which they were asking 3s. per lb., but it would not sell at the figure, although it is the cleanest and strongest rubber next to Para I have bought flake rubber as low as 6d. per lb. I do not know any African rubber which does not lose from 25 to 30 per cent. in washing and masticating. I have known Mozambique rubber to lose 60 per cent. in washing and masticating, and all African rubbers lose from 25 to 60 per cent. I was never asked above 2s per lb. either in London or Liverpool for Congo Ball, and it is one of the cleanest and strongest African rubbers known. Let him (the Professor) send a sample to Moseley's of Manchester, or MacLellan's of Glasgow, or W Warner of Tottenham, and they will give its proper market value. Rubber-growing ought to pay in Natal, if kept clean, and not too much sand is put in."—*The India-Rubber Trades' Journal*, March 31.

THE MYCOLOGIST'S REPORT FOR 1901: DEVELOPING NEW ORANGES.

AMERICAN EXPERIMENTS.

A large crop of paper bags seems to be the yield of a little tree which stands in the grounds of the Department of Agriculture at Washington. There are about 50 of these bags, each with the neck tied firmly, as close inspection discloses about one of the terminal twigs. The effect, writes a contributor to the "New York Sun," is rather grotesque. The tree is the particular charge of Professor Herbert J Webber, who with his assistant is responsible for its bagging. It is a species of orange tree, the variety having been brought to the United States from China about ten years ago with the idea of using it for hedges. It is evergreen, grows about 30 feet high and has sharp thorns. The fruit is small and runty, and quite unfit for food. But the fact that it flourishes as far north as Maryland, Kentucky, Indiana and Missouri, gives it a great value to scientists, who are experimenting with a view to securing a more hardy breed of orange.

And this is the explanation of the crop of paper bags. The blossoms of the tree have just been crossed with the St Michael and Siguina oranges, which are the standard varieties of sweet Florida fruit. Professor Webber is trying to secure a hybrid which will retain the edible qualities of the sweet Florida orange and at the same time preserve the hardiness of the Chinese mother tree. The paper bags are used to protect the flower which has been fertilised with the pollen of the sweet orange. The first step in the operation of cross-fertilisation is the removal of the pollen-bearing stamen from the blossom. This is done with small scissors and pincers. The petals are also removed, leaving the stigma exposed. This is all done before the blossoms are fully opened, for by that time there is danger that bees or other insects might have carried the pollen from some open blossoms and deposited it on the stigma. When the stamen has been completely removed pollen gathered from the blossoms of the trees in the Government green house are shaken lightly upon the prepared flower. Then the bag is tied tightly in place to make sure that no pollen from the same tree becomes mingled with that already used. After the fruit has had time to begin forming the bags are removed and the twig marked with a tag, giving the name of the other parent.—*Melbourne Leader*, April 5.

ELECTRIC-MOTOR TEA-WEIGHING MACHINE.

16 POUNDS A MINUTE.

A novel and intricate apparatus has been installed in the tea warehouse of T H Estabrooks, St. John, N. B. This is nothing less than an automatic weighing machine capable of weighing out 16 separate pounds of tea per minute. It is an ingenious contrivance. From a hopper in the floor above, the tea is conveyed to the machine by a funnel fitted with automatic jaws, which close the moment 1 lb. of tea is deposited on the pair of scales. In the meantime a bag is being pressed up beneath the pan, which revolves, and into this package the tea is dumped, while another pan takes the place of the first (there are two pans). The whole contrivance is run by a small electric motor, and it can be adjusted to any weight and regulated. It is said to be the first machine of its kind in Canada, and was made by Driver, London, England.—*Indian Planters' Gazette*, March 29.

MR. CARRUTHERS ON FUNGAL DISEASES.

It is an evidence of how the work of the Scientific Staff at Peradeniya is growing that the report of the Assistant Director this time, in place of following that of Mr. Willis in a sessional paper, is given publicity separately in one of the circulars issued by the Botanic Gardens. This circular we will, as usual, reproduce in full in our *T. A.* and need therefore only mention here that Mr. Carruthers supplies a very interesting, as well as adequate, report dealing with Environmental as well as Fungal Diseases, with "Leaf Diseases of Tea," with "Spore Distribution Experiments," gives hints as to Tea Blight Investigation," "Gray

Blight on Young Shoots," "Root Disease of Tea," "Cacao Canker and other Diseases," "Grevillea Disease,"—for which a special circular is later on to be issued,—"Finger and Toe Disease of Cabbages, etc." "Fungi causing Rotting of Timber," "Fungus on Rubber," [this refers to fungus which grows upon samples of Para Rubber—it does not seem to be of much importance], "Other Diseases of Plants," "'Bluestone' as a Weed-killer," "Grass Seeds for Pastures and Lawns," "Cacao Cuttings," "Measurements of Cacao Pods," with illustrations, which Mr. Carruthers had previously frunished to our monthly; "Selection of Seed in Cacao Planting," "Pollination of Cacao," and "Tours and Planters' Association Meetings." These all show that Mr. Carruthers has a good many subjects under his observation and we may make sure now that no new trouble or what may appear to a planter to be a new disease, will be allowed to escape the notice of the Mycologist. In the matter of greatest importance, diseases affecting tea, Mr. Carruthers reports that tea has been throughout the year 1901 less affected by leaf disease than during 1900.

PLANTING NOTES.

A LUCKY ORCHID PURCHASE.—An orchid grower at Kenilworth has had a piece of good luck. Some time ago he bought for a few shillings from a dealer abroad an orchid in sheath. This turned out to be a rare specimen of the Odontoglossum Crispum. He gave it the name of "Mabel Whateley," and the plant gain'd the award of merit at the last show of the Royal Horticultural Society in London. He has just succeeded in disposing of his treasure for the sum of £220.—*Home paper*, March 11.

THE INDIAN TEA EXPANSION COMMITTEE.—We quote the chief details from this Committee's latest report, which shows that subscriptions and the sale of pice packets continue satisfactory As compared with 64,327 packets issued in December last, 111 640 packets were issued in January and 135,038 in February. This is a notable increase. Similarly the number of one pie cups of tea sold almost doubled itself within the three months in question. The sale of the pice packets and the brewed tea, we notice, does not yet cover cost, so the working expenses of the Commission have been somewhat increased. The Commissioners, however, hope that these methods will prove a valuable means of fostering the habit of tea drinking amongst the people of India. An outside opinion of the Commission's work that is very encouraging recently appeared in the *British Medical Journal*. "When one comes to consider," says that journal, "the awful death-rate among the Indian poor from such diseases as cholera, bowel complaints, and malignant fevers, all of which owe their origin to the drinking of impure and unboiled water, one is struck with the life-saving prospect of a scheme such as that of popularising the drinking of tea, since tea-making entails water-boiling, and this kills all germs that produce disease."

MALARIAL FEVER.—An Indian contemporary writes:—It is satisfactory to see that the Italian Government and Italian men of science are energetically following up the question of the connexion between mosquito bites and the spread of malaria. They are now specially working at the question of what practical measures can be taken to destroy mosquitoes. It has been discovered that there is a particular aniline dye which, even when very dilute, will kill the larvæ of mosquitoes. There is also a powder made from the flowers of the *Pyrethrum Roseum* which is said to be very efficient against mosquitoes when burnt in a room or distributed through the air by means of bellows. Experiments in a slightly different direction have been conducted by Professor Grassi during the past summer, with a view to ascertaining what drugs are most efficient in destroying the malarial poison. He selected one of the most malarious places in Italy—Ostia, at the mouth of Tiber—and administered to a number of persons pills composed of quinine, arsenic, iron, and a further ingredient which is somewhat unscientifically described in the Consular Report as "bitter herbs." The results seem to have been satisfactory, and Dr. Grassi is preparing a full report on them, which will be published in English as well as Italian.

THE TEA INDUSTRY.—Speaking at the *Society of Arts* in a paper by Mr F H Skrine on "Bengal" some interesting remarks were made by Mr. T. Durant Beighton who said that the two subjects on which he wished specially to speak were tea and famine. No doubt the reader of the paper was accurate in saying that Mr W H Verner was the first person to introduce tea into Jalpaiguri, but in justice to himself he (Mr Beighton) wished to say that who when he joined that district of the Duars as Deputy-Commissioner in 1876 the number of tea gardens was only six or seven, but during his incumbency they increased to 50 or 60. The present condition of the industry was very serious. Over-production had glutted the markets of the world, particularly the British markets, and the planters had not the power of combination of which he should like to see them possessed. They should borrow a little of that aptitude from the other side of the Atlantic for the making of trusts. The tea planters of Ceylon and the tea planters of the Tea Association of Calcutta ought to combine and take some steps in the direction of effectively limiting the output especially of low grade teas and of getting rid of some of the evils which undoubtedly now affected the conduct of the business. He wished to enter his emphatic protest against any further burden being put upon tea. Of all the industries which had flourished since our rule had commenced, that of the tea plantations had been upon the whole of the greatest good to the over-weighted population of that country. No doubt, when the gardens were first opened up, there was a certain amount of deadly malaria, but after that he believed there was no healthier occupation or an occupation more conducive to long life and prosperity of the coolie, his wife and family, all of whom found remunerative employment, than employment in tea gardens and tea estates. There was the further great advantage that it removed the population from congested areas and permanently settled them where their labour was required for the development of the country.

THE GAME PROTECTION SOCIETY.

THE REPORT.

In submitting my report for the year 1901, it is expedient that I should notice briefly the work done by the Society during the year. Mr North C Davidson's last annual report, embodying all ordinances, enactments, and proclamations relating to the protection of game in Ceylon, was circulated amongst members of the Society early in 1901, but it fails to record the proceedings of meetings held during the latter portion of the preceding year. Two general and three sub-Committee meetings were held and at these, certain schemes for the better protection of game were discussed and eventually a definite scheme was elaborated and laid before Government. It dealt with that very difficult question, the native trade in deer horns, and recommended that a strict censorship be placed by Government upon this traffic through the officers of the Public Works, the Forest and the Survey Departments, as well as through the Presidents of Gansabhawas, suggesting that all these be armed with the powers of Itinerating Police Magistrates Government replied on August 14th, 1900, that the suggestions laid before them by the Ceylon Game Protection Society were incapable of being put into practice, at the same time undertaking to carry out a proposal to register and license professional game trackers.

The Society also expressed its approval of the Draft Firearms Ordinance as published in the Government *Gazette* No. 5649 of 29th September, 1899. The Sub-Committee drafted during the year an appeal to visiting sportsmen, inviting donations to the C G. P Society. This was duly circulated through the Government Agents of the various provinces but appears to have been but feebly responded to, and the revenue of the Society from this source may be quoted as too insignificant to be worthy of notice. At a general meeting in June, 1900, the introduction of Indian antelope (Black Buck) was proposed and duly considered, and at a general meeting in July a sum of R1,000 was voted for this purpose.

The Hon. Secretary (Mr Davidson) forthwith put himself into communication with His Excellency the then Governor of Madras who most kindly and liberally offered to the C. G. P. S, a number of antelope from Guindy Park. Numerous suggestions were made as to the best localities to stock with these animals and the hearty co-operation and support of our Government Agents in the North and South was promised. Everything in fact was in train for establishing them in the island, but unfortunately they had to be caught. From correspondence submitted to me this difficulty appeared so great and so likely, in conjunction with the transport of these fragile animals over sea, to be attended with loss and considerable cruelty that upon my assumption of office as Hon. Secretary of this Society I suspended negotiations with Madras. The acclimatisation of game is a costly undertaking, if the efforts made are likely to be crowned with success; and in my opinion the Society is not sufficiently wealthy to expend such a large sum of money in the face of such doubtful results. Previous experimental efforts to introduce feathered games have failed completely, and before any more are undertaken our list of members as well as our annual subscriptions should be doubled. Before closing the *resume* of the year's work, I must allude briefly to a rule that was framed by the Society and put into operation by Government in 1900-1901. This rule prohibits all shooting of deer and sambur in the Hill Reserves above an elevation of 4,000 ft, except by special permission of His Excellency the Governor. The concession was asked for by the Society with the object of protecting sambur in those portions of the Hill reserves where elk-hunting could be indulged in. The subject was freely discussed and it was competent for any member of the Society to oppose the rule or to propose a modification of it. Unfortunately the Province of Uva does not appear to have been represented at the meetings, or if it wa the voice of protest was not raised and the rule passed into practical law. I say "unfortunately' for it has given rise to bitterness on the part of certain Uva members who had been in the habit of shooting red deer and who complain that they are debarred by this rule from a sport they had hitherto enjoyed on their patnas, at elevations exceeding 4,000 feet. The resignation of the Honorary Secretaryship by Mr. N. C Davidson occurred during the year and in January, 1901, I was elected to fill the post. The year 1901 was not remarkable for any great change or improvement in the constitution or scope of the Society. Three general meetings were held in Nuwara Eliya and the Sub-committee had under consideration two important papers from Government, dealing (1) with the Yala Sanctuary and (2) with a proposal to enforce old Forest Laws. The recommendations by the Sub-committee with regard to both these have been approved by the Government. I. In Mr. Horsburgh's report on Sanctuary that gentleman made certain suggestions in paragraphs 24, 25 and 28. These were approved of by the Committee and subsequently adopted by Government. II The application of sub-sections D of section 26 of Ordinance 10 of 1885 was recommended by the Assistant Government Agent of Nuwara Eliya to Reserved Forests and it will probably be put into effect.

Subscriptions and Members.—It is a great pleasure to me to be able to report that many subscriptions, which had remained unpaid during the two or three preceding years, were paid up during 1901. A few resignations, hitherto unrecorded, were received from members who had ceased to subscribe for some years and a few members were lost by their leaving the island. It is a matter for regret that the new members who have joined during the year fail to make up the deficiency in numbers due to the causes abovementioned. It is also regrettable that more pecuniary support is not forthcoming and, if in future years it is found that some of the old sporting centres are played out and barren of game, the younger generation of sportsmen will have only themselves to blame for their apathy of today. Moreover, should the C.G. P. S. lapse and allow its duties and responsibilities to be absorbed by Government, there will be no reasonable ground for surprise if it be found that Government, having paid for the protection of game, shows a disinclination to grant practically unrestricted sporting rights such as we enjoy today. To maintain our position and to ensure a hearing for our suggestions, the Game Protection Society of Ceylon should bo a stronger and a more representative body than it is at present. We should not lose sight of the fact that its soope is exceedingly limited and restricted by the laws of the land, and that the power the Society possesses is measured by the length of its purse or in other words by its balance at tho bank. To enable us to wield this power effectively, we must devote most of our resources to the payment of game watchers. Under this heading progress is being made and much good is being done in the hills. The destruction of sambur by coolies and by poaching gangs generally has almost ceased. Two watchers, paid by Government at the rate of R15 each per month, are subsidised to the extent of R5 each out of the Society's funds. Two forest peons are also in receipt of the same sum monthly from the same source. In the low country the Yala Sanctuary is watched by night watchers employed by Government and in the proposed new Sanctuary in the Puttalam District four men are to be employed.

The Society pays R30 per month for two watchers in the Meda and Kadawatte Korales under the supervision of the Madawelletenne Ratamahateya. During the year under review a sum of R20 per month was applied for by the Haputale Branch Society and in my opinion this should be disbursed from the Society's funds. I would further suggest that four-fifths of the Uva subscriptions be added to this amount, so that an efficient system of protection

may be established over a wide area of country, extending, if possible, south to Tanamalvila and across to the northern limit of the Yala Sanctuary. This would provide at least a measure of protection to almost the whole of the Uva Province. With a careful selection of watchers and some supervision from the Honorary Secretary of the Haputale branch there is no reason why the Game Centres of Uva should not receive a large measure of protection by these means. The subject of Branch Societies was again brought up at a general meeting held on May 8th 1901 and the distribution of game watchers was discussed. It was eventually resolved that the latter should be postponed until Branch Societies had been formed.

On the 17th October, 1901, the Hon. Secretary of Haputale Branch introduced a resolution against the rule prohibiting all shooting of game over 4,000 feet. This resolution was eventually withdrawn in favor of an amendment to the effect that it should be permissible to stalk sambur with the rifle where registered packs are limited and at any elevation. It was also resolved at the same time that red deer be removed from the list of protected game. A copy of the above resolution was forwarded to Government by the Hon. Secretary with the expression of a hope that they would be favourably considered. The Hon. the Colonial Secretary replied as follows:—

Colonial Secretary's Office,
Colombo, November 20th, 1901.

Sir,—With reference to your letter of the 30th October, 1901, regarding the shooting of sambur and deer in the Hill Districts above 4,000 feet, I am directed by His Excellency the Governor to explain to you that the "rule" referred to by you is enforced solely by an instruction to the Government Agents to refrain from issuing licenses to shoot game in any district above the elevation referred to.

2. It would be impossible to grant a license in respect of any special class of "game."—I am, sir your obedient servant.

(Signed), A. G. CLAYTON, for Col. Secy.

The Honorary Sec., The Game Protection Society.

BRANCH SOCIETIES.

I regret being unable to report any addition to the number of these during the past year but I do not abandon all hope on this point. Mr. P. R. Shand, the energetic Honorary Secretary of the Nawalapitiya Branch, sends me the names of 16 members who have paid their subscriptions for 1902 and writes hopefully of future support;—

"On information received from our local watcher on 31st October last I wrote to the Government Agent, Kandy, that an elk had been killed at Padupola for a former Aratchchi of that place.

"The Ratemahatmaya of the district was instructed to prosecute and the man was fined R25, which seems little enough as he killed the elk in the close season. The Branch Association or Society started here has brought in a lot of new members. There were 17 on my old list and there are now over 40 on the new one.

P. R. SHAND."

Not having received any financial report for 1901, I am unable to give any information as to what work has been done. In Haputale I cannot help feeling that there is a slightly reviving interest being shewn in the matter of game protection, and it is to be hoped that the Branch Society there will be able to show a good record of work done this time next year. There is ample scope for hearty and undivided efforts.

Since writing the above, I have received from Mr P R Shand a list of members for 1901 and a statement of expenditure for that year.

Mr SHAND proposes handing over to the Parent Society 25 per cent of his total subscriptions and retaining the balance (after providing for last year's expenses) as a nucleus for further needs and requirements. This arrangement, I think would work quite satisfactorily, provided the estimate of requirements were sent in to the Parent Society in time for the annual meeting in March or April.

It would I think, be only right and proper that the Committee of the Parent Society should pass the estimate and sanction the expenditure.

SANCTUARIES.—During 1901 the Yala Game Sanctuary was visited officially by Mr Hosburgh the Assistant Government-Agent at Hambantota and his very able and exhaustive report was doubtless read by all members of the Society. There are certain paragraphs in that report—viz.: 24, 25, 28—which were suggested by Mr. Horsburgh and which were subsequently approved of by His Excellency the Governor. The two former recommended that houses be provided for the three newly-appointed watchers and the clearing of one of the boundaries. The latter suggested that the country adjacent to Kirindi, Tissa and Palutupane be closed to all non-resident sportsmen. This is a concession that might well form a precedent in the case of other tracts of game country in the island. Through the courtesy of the Hon. Mr Fowler I have recently learned that an efficient water supply has been provided for within the sanctuary and a proper system of patrolling has been established. Game is reported as very plentiful, tame and in good condition. I am also indebted to Mr. H. R. Spence, the Assistant Conservator of Forests, North-Western-Province, for the following information with regard to the proposed new Sanctuary in the Puttalam District of the North-Western-Province. It will consist of all the country lying north of the Kaluoya, some 112,000 acres in extent. It will probably be placed under the charge of the Assistant Conservator of Forests and four watchers who will be paid by Government. All the reports I have received from the Yala Sanctuary clearly set forth the benefits derivable from these protected areas and the Society should now approach Government with a view to obtaining sanction to form sanctuaries of its own.

Complaints have reached me from Trincomalee from time to time of a vast amount of poaching and game slaughter in that and adjourning districts both in and out of season, but unfortunately, in spite of the quantity of game killed by the officers of His Majesty's services in that neighbourhood, the C G P Society receives no pecuniary support from that quarter.

DONATIONS.

I am glad to be able to report the receipt of two handsome donations to the Society during the past 12 months: one of £10 from that well-known sportsman and member of this Society, Mr H A Oliverson; and one of R100 from Sir Edward Kinahan, who has recently been on a shooting trip to the island. Three others of small amounts have been received from Messrs. Jowitt, F R Findlay and H Storey. These donations are encouraging to an Hony. Secretary, and I cannot too heartily express the thanks of the Society for them, nor can I too emphatically commend them to the notice of others.

Before closing this paper, I feel it to be my duty as Hony. Secretary to enter a protest on behalf of the Society against the practice of allowing inexperienced sportsmen to destroy elephants that may prove themselves troublesome within the stockade of a Kraal, and the recent instance at Kurunegala em-

phasies the necessity for this in a marked degree. It was not an edifying spectacle for crowds of natives to witness, nor a credit to those engaged in it.

PRODUCE AND PLANTING.

Mr. J. Ferguson of the *Ceylon Observer* writes :—Certainly it is well to rub in the labour view of the question, and the figures given are very much to the point, but presumably Sir M. Hicks-Beach and the majority of thinking people at home are aware that natives are employed in large numbers on Indian and Ceylon tea gardens, and that these will suffer if the industry be restricted. The Secretary of State for India and his advisers can hardly be ignorant of the fact either, although the figures given by Mr. Ferguson may come as a surprise to them. [Our contemporary forgets that the London *Times* editorially asked by what right the Viceroy of India and others interfered in the financial arrangements of the United Kingdom. We think our figures give the best reason and justification.—ED. *C. O.*

The annual general meetings of the following tea companies have been held in Colombo and dividends declared: Castlereagh Tea Company of Ceylon, Limited, final dividend of 3 per cent., making 8 per cent. for the year; Drayton (Ceylon) Estates Company, Limited, 5 per cent., making 8 per cent. for the year; Uvakellie Tea Company of Ceylon, Limited, 7 per cent.; Palmerston Tea Company of Ceylon, Limited, 2½ per cent., making 5 per cent for the year; Yataderia Tea Company of Ceylon, Limited, 20 per cent. Discussing the

INDIAN TEA CROP

for 1901-02, and commenting upon the estimates of the Indian Tea Association, the "Grocer" says: "To form some approximate idea of what was about the quantity of Indian Tea grown in 1901, we must take into account the amounts that were probably raised in the 'private' and other gardens, which, we venture to say, were of too great importance to be entirely ignored. These, it is not unreasonable to assume, could hardly have fallen below 10,000,000lb of tea, equal to nearly as much as was gathered of the last season's combined crops in the Darjeeling and Terai districts. This quantity, added to that returned for all other centres of tea cultivation in India, would bring the grand total crop for 1901-02 up to 175,263,453 lb, as against 188,937,257 lb (including every kind and place of growth) for 1900-01. Here is plainly shown a difference or deficiency of over 13,703,000lb in the crop now coming to a finish. Treated another way, by reckoning the yields in regions where precis returns are easily obtainable, the decrease is almost as great, viz., fully 12,413,000 lb. Such an abridgment in the general supply of tea from one particular source in a single season could not fail, as we have seen, to exercise a very favourable influence on the market for importers, raising prices for the common sorts by 2d per lb from the lowest point in their favour. A well-known Mincing Lane authority observes that 'the producer has it largely in his power to make or mar.' It is certain, at any rate, that, if growers are again placed in the position they occupied in 1900-01, when they had to force a quantity out of all proportion to consuming possibilities down the throat of the trade they will again feel the inevitable result of transgressing the laws of supply and demand. The heavy extensions carried out about the middle of last decade are only just coming into full maturity, and under normal weather the approaching crop may easily be got out of hand Speaking generally, no disturbing feature mar the outlook ,if only the market is not over-fed The use of tea is becoming more and more common throughout the civilised world, and some compensation may here be found for the low prices which have accompanied excessive supplies, and no doubt aided the opening of new markets. The grower has, however, sown freely to his cost: let him now pay attention to the reaping. To judge from Ceylon figures the determination to limit quantity is being well sustained. India should in the coming season see that she also follows a like policy."—*H. & C. Mail*, April 4.

PEPPER IN WYNAAD.

Wynaad, April 15th.—Considerable uneasiness has been felt, during the past year, at the blights which have worked a certain amount of damage amongst the vines in parts of the district, and hitherto no specific prophylactic seems to have been discovered. On the other hand liberal cultivation including the application of plenty of farmyard compost, has been followed by most satisfactory results on the vines raised through fields of Arabica coffee, and on one estate the yield this season where such conditions obtain has been phenomenal, and is estimated at considerably over 12 cwts. of the dried spice per acre. When it is borne in mind that 5 cwts. per acre is deemed a good pepper crop, the above return will appear to be the more striking. On the garden referred to little, if any, disease has shown itself, though the property has been under coffee and pepper for somewhere about 30 and 20 years.—*Madras Mail.*

RHEA FIBRE SYNDICATE.

A Company is being formed under the name of the Bengal Rhea Syndicate Company for the purpose of supplying machinery and aiding the planter in the cultivation of rhea. This beautiful fibre, unlike the aloe, which is grown only for ropage, can be used for a variety of purposes, from the manufacture of a silk pocket handkerchief to a hawser, and as it has been conclusively proved that it can be successfully grown in this district, rhea should have a future before it in Behar. The Syndicate's object is to facilitate the cultivation and manufacture of rhea and, although they are fully engaged for some time to come, applications have been received to extend their terms to a number of other concerns, should the Syndicate decide to increase its capital.—*Indian Planters' Gazette*, April 26.

A POSSIBLE RUBBER YIELDING PLANT.—The Governor of Zanzibar has sent seeds of *Taberanœmontana usambarensis* to the Agri-Horticultural Society of Madras, with a note that the fruit attains the size of an ordinary melon and exudes a juice very much like rubber. Mr. Cavanagh notes that the whole plant appears to contain a great amount of white milky fluid which flows from the slightest bruise on the bark, or from a cracked leaf. About sixty per cent of the seeds have germinated, and are looking strong and healthy.—*Indian Gardening and Planting*, April 17.

ROYAL BOTANIC GARDENS.
REPORT FOR 1901.

We are enabled, through the courtesy of the Acting Government Printer, to give the greater part of the Report of the Director and of his Assistants as a *Supplement*, and we need here only call attention to a few salient points. It is satisfactory to learn that last year, so depressing in respect of the price of our staple, was free from any serious epidemic of plant diseases. The success of "camphor" as a minor product,—we hear of distilling being successfully carried on by private parties, notably on a Kotmale estate,—and the discovery that we have indigenous guttapercha trees, which yield a gutta in fair quantity by simple tapping, which, though not of good quality, may prove commercially valuable, are two very interesting facts. Indiarubber being now an established planting industry within the certain limited area adapted to its cultivation, the export of appreciable quantities, much valued in the London market, has begun and may be expected to increase very steadily. There is also much to encourage the extension of Cinchona planting—which, by the way, must be in districts too high for Rubber—and there is room probably with judicious selection of the land, to add to the area under Cacao; while most certainly more should be done in Pepper. Mr. Carruthers' Report has already been the subject of notice. From the Mycologist's Report, we are glad to see that there is some hope of successfully introducing Sericulture —so frequently the subject of spasmodic experiments in Ceylon—and of getting the Sinhalese to take it up in certain rural districts. And why not also Apiculture?—we would ask Mr. Green, this being another industry well within his province. He will know that we have two honey-making bees peculiar to Ceylon; but we are unaware of any local attempt to domesticate them, though an American Apiculturist (now Professor in the Agricultural Department at Washington) took away colonies of these bees to try in Cyprus and Michigan, with what result we have never definitely heard. Mr. Green's Report shows that he has had a thoroughly busy and useful year. In the opinion of many planters Mr. Herbert Wright, "the Scientific Assistant" is "the coming man," and on the Experimental Station at Gangaroowa, he ought to have abundant scope for useful work that may have important results. His investigations into gutta-yielding trees are likely to add a new export erelong. His Report as Acting Curator also shows much useful work. Mr. Nock has, as usual, a very interesting Report to furnish of the Hakgala Gardens and connected work: 2,000 camphor plants have been distributed and 4,000 more were being got ready to send out. An experiment in growing Mango trees (seeds got from trees growing at 4,200 feet above sea level in Madagascar) at this high elevation will be watched with interest. We are not told much of the subordinate Gardens at Henaratgoda, Anuradhapura and Badulla—save that the latter is now a great ornament to the town and that Pimento has there fruited well and should be worth a trial as a minor product throughout Uva; while a new Australian fodder grass is also growing well.

THE COST OF PLANTING RUBBER.

Many inquiries are made as to the cost per acre of planting rubber trees, which work, to the uninitiated, doubtless seems a very simple matter. But it is evident, from the printed reports of some of the large plantation companies, that the mere setting out of the young seedlings must represent but a small part of the work necessary in forming a plantation on land just reclaimed from the native forest. Before there can be any planting, must come the establishment of a community of laborers —which does not, of course, exist in a forest-covered region. The work of clearing is no small matter, and this is followed by the planting, continued probably through several years, with simultaneous care of the trees already set out. It seems to be the part of economy to produce on the plantation, as far as possible, crops necessary for the subsistence of the men and animals employed, and not a few companies are engaged also in the cultivation of "side crops" for market, such as will yield an income while the rubber trees are reaching a productive age.

On one plantation in Mexico, a report of which has reached us, although the greater part of the projected rubber planting remains to be done, a village has grown up, with a population varying from 250 to 500, a municipality has been organized and a post office established. There is a company store, carrying a stock of goods valued at $03,000 Mexican; a meat market, blacksmith's shop, laundry, saw mill, brick-making plant, and lime kiln; and also a school for the children on the plantation and a salaried plantation physician. There is even a police force—paid for, like everything else mentioned above, by the company. It is only by making an outlay for these various purposes that a supply of labor can be insured for the coming years of development which must precede the first yield of cultivated rubber from this plantation. There must be labor for constructing buildings, laying out roads, building numerous small bridges, and for planting the various quick-producing crops—all of which work is carried on while other laborers are clearing land, making rubber nurseries, and transplanting rubber seedlings and caring for them for the first few years. Moreover, some outlay is often necessary for creating means of transportation to the nearest railway or seaport.

Of course the plantation referred to is one of the larger enterprises of this class in Mexico; but even on the small private plantations the owner does not calculate to plant or live by rubber alone. There are, on the small as well as the large estates, many items of outlay beyond the mere setting out of rubber trees, so that the prospective planter who confines his estimates to this one feature alone is likely to be doomed to early disappointment. All of which would indicate that the question so often heard, as to the cost per acre of "planting rubber," is much easier asked than answered.—*India Rubber World*, March 1.

TWO DISEASES OF CACAO TREES.

The occurrence of the disease known as 'thrips' on the cacao trees of Guadeloupe has been reported upon by M Ang. Eiot, who states that the insects causing the disease is widely distributed among the cacao plantations. The pest was the subject of an article in the *West Indian Bulletin*, Vol. II. pp. 175 190, where its occurrence in Grenada, St. Vincent, St. Lucia and

Dominica was noted, with a description of its habits and distribution in Grenada. The damage to the cacao tree is sometimes insignificant, sometimes great, according to the climate, conditions, drought and neglect rendering the trees very liable to an attack. Experience shows that, while proper care of the trees will do much to avert the disease, ultimate reliance must be placed on spraying the tress with kerosene emulsion, The insect appears to be closely allied to the 'thrips' affecting cacao in Ceylon, both the Grenada and Ceylon larvæ being characterised by a transverse crimson band.

Professor Giard, to whom an insect has been sent, has named it *Physopus rubrocincta*, though it has been hitherto regarded as belonging to the genus Heliothrips. The Geographical distribution, as known at present, is Grenada, St. Vincent, St. Lucia, Dominica, Guadeloupe and Ceylon. It is not improbable that the insect will be found to occur in the other parts of the West Indies and South America.

A short time ago, attention was drawn to another disease which attacks cacao trees in Surinam, producing bunches of malformed twigs called 'witch brooms.' In 1900, Professor Bos. of Amsterdam, discovered asci, or fruiting organs, of the *Exoascus* type, on the underside of two rudimentary leaves on the twigs of the 'witch brooms,' from which he concluded that the disease was due to a new fungus, related to those which produce 'witch brooms' in other trees and which he named *Exoascus theobromæ.* Professor Went, of the University of Utrecht, has found that in cacao trees containing 'witch brooms' the pods are attacked by a fungus which causes a swelling at the side, and finally produces a worthless, hard and woody pod. He considers that the fungus causing this malformation, may be allied to that which produces the swelling, but since, up to the present, no spores have been observed, the identification of the fungus has been unsuccessful. The planters in Surinam find it advisable to cut out the 'witch brooms' as soon as they are observed. This method is sufficient to keep the disease from making much headway, but, if carried on to a large extent, will undoubtedly impair the productiveness of the trees.—*Imperial Institute Journal* for April.

PLANTING NOTES.

"GREVILLEAS" DOOMED?—What is this news we hear of grevillea trees on estates in Uva dying out from a fungus attacking the roots? Mr. Carruthers has been to see the evil when it was first observed and, we believe, approves of the trees being cut down and dug out. How about grevilleas in other districts—in Dimbula, for instance? We would strongly advise a careful inspection. There is always the danger of such disease spreading. Who can tell us if the "silky oak" (as it is called) is affected in this way in its native home of Queensland?

SALE OF DWARF TREES.—A number of Japanese dwarf trees, and a collection of miniature British and foreign woodland scenes, belonging to Mrs. Ernest Hart, were offered at auction on Thursday by Messrs. Knight, Frank and Rutley, Conduit-street. Several dwarf cedars sold at good prices. One, which was catalogued as 100 years old, with thick twisted trunk and well-balanced branches, fetched £20. A second, also 100 years old, and measuring 22in. in height, was sold for £14 14s. The demand for miniatures was less brisk; the prices obtained ranged from £6 6s to £3 3s. Several lots were purchased on behalf of Royalty.—*Daily Chronicle.*

RUBBER, COFFEE, &C. IN ABYSSINIA.—In the *Century* Magazine for April there is a paper by H Le Roux which gives a striking picture of Menelik's country. As regards products, here is what is said:—

On the varied levels of the Abyssinian table-land everything may be cultivated in the way of luxurious products—rubber, coffee, cocoa, vanilla, spices, mulberry, etc. As a matter of fact, the combination of a tropical heat and an Alpine altitude, so to speak, produces in Abyssinia climatic conditions which are certainly unique. These different plateaux resemble nothing so much as a series of greenhouses placed one above the other—cold, temperate, and hot. No matter what the altitude, the temperature is remarkably fixed. I was able to live in Abyssinia for six months, under a tent, at an average of sixty-five hundred feet, without ever being inconvenienced by the cold. Wherever I went I met with vineyards and palm trees, growing readily even at an altitude of eight thousand feet. It is true, also, that these unusual conditions have made Abyssinia an inexhaustible coffee-granary. The fact is now established that this precious plant is not only abundant in Abyssinia, but that it is native to this plateau. It was from the Abyssinian province of Kaffa that coffee, hitherto unknown, was first carried into Arabia. This gave it its name. Even nowadays the inhabitants of Kaffa do not take the trouble to cultivate the coffee-plant; they are satisfied to gather coffee wild under the trees—coffee trees of a size so prodigious that the natives cut them down and out of the trunks make boards thick enough to build their houses. The quality of the aroma is so superior that the English decidedly prefer it to the true Arabian Mocha, or, to speak more litorally, to all the Red Sea coffee which goes to Mocha and there receives a baptism of good origin. As things now stand all these products are raised by the Abyssinians only in proportion to their limited needs. They are spoiled by this land of unrivalled fertility, which, in certain places, gives as many as four harvests a year. They ask of it merely the cotton necessary to roll themselves in gay-colored coverings which, when they travel, protect them against the night chill. They sow just enough corn, wheat, durra, sorghum, and canary-seed to live on, and they leave the stretches of land that fire or continued occupation have devastated to grow wild as prairie-lands, which serve as pasture for quantities of goats and enormous sheep, whose wool becomes a long, shaggy coat, and especially for fine herds of cows and zebus with humps on their backs which are luscious eating.

The paper closes as follows:—

Emperor Menelik gave the definite pledge of his esteem for Western civilisation in renouncing with iron will the isolation wherein his predecessors had placed all their confidence. In 1882 he addressed to the President of the French Republic a letter drawing up in these terms of his plans of reform: "I wish to open up, to make safe for science, commerce and industry, the routes which lead from Shoa to the rich southern countries." In order to attain such civilised ends, the emperor has given his faithful friends, M. Ilg and M Chefnoux, a grant for all the railroads which, starting from the French harbor of Jibuti, on the Indian Ocean, at the entrance of the Red Sea, must in time unite the rich provinces of the west, the land of gold and coffee, with the shipping-dock where all the vessels of the world will touch. Already the first branch of this railroad, that which connects the harbor of Jibuti with the mountains of Harar, is almost finished; the deserts of Issa and Dankali have been traversed; and the greatest natural difficulties presented by the soil have been overcome.

Some allowance must be made for over-sanguine expectations; but, no doubt, the development of Abyssinia is bound to go ahead.

SHARE LIST.

ISSUED BY THE

COLOMBO SHARE BROKERS' ASSOCIATION.

CEYLON PRODUCE COMPANIES.

Company	paid p. sh.	Buyers.	Sellers.	Transactions.
Agra Ouvah Estates Co., Ltd.	500	...	850	825
Ceylon Tea and Coconut Estates	500	..	—	—
Castlereagh Tea Co., Ltd.	100	—	95	—
Ceylon Provincial Estates Co. Ltd.	500	500	..	...
Claremont Estates Co., Ltd.	100	—	—	—
Clunes Tea Co., Ltd.	100	45	...	50
Clyde Estates Co., Ltd.	100	—	—	—
Doomoo Tea Co., of Ceylon Ltd.	100	..	70	67½
Drayton Estate Co., Ltd.	100	—	..	—
Eila Tea Co., of Ceylon, Ltd.	100	25	—	—
Estates Co of Uva, Ltd.	500	..	205	200
Gangawatte Tea Co., Ltd.	100	—	—	—
Glasgow Estate Co., Ltd.	500	925	—	950
Great Western Tea Co., Ltd.	500	610	—	610
Hapugahalande Tea Estate Co.	200	—	150	—
High Forests Estates Co., Ltd	500	...	—	475
Do part paid	400	—	...	—
Horrekelley Estates Co Ltd	100	—	80	—
Kalutara Co., Ltd.,	500	—	225	—
Kandyan Hills Co., Ltd.	100	—	40	—
Kanapediwatte Ltd.	100	—	50	..
Kelani Tea Garden Co., Ltd.	100	..	35	—
Kirklees Estate Co., Ltd.	100	50	—	...
Knavesmire Estates Co., Ltd.	100	...	45	—
Maha Uva Estates Co., Ltd.	500	—	350	...
Mocha Tea Co., of Ceylon, Ltd.	500	675	--	—
Nahavilla Estate Co., Ltd.	500	..	300	—
Nebeda Tea Co., Ltd.	500	—	...	—
Palmerston Tea Co., Ltd.	500	...	400	—
Penrhos Estates Co , Ltd.	100	—	87½	—
Pitakanda Tea Company	500	—	...	—
Pine Hill Estate Co., Ltd.	60	...	40	—
Putupaula Tea Co., Ltd.	100	...	..	—
Ratwatte Cocoa Co., Ltd	500	.	—	—
Rayigam Tea Co., Ltd.	100	...	40	—
Roeberry Tea Co., Ltd.	100	80	—	77½
Ruanwella Tea Co., Ltd.	100	..	32½	30
St. Helier's Tea Co., Ltd,	500	...	—	—
Talgaswela Tea Co., Ltd.	100	12½	20	—
Do 7 per cent Prefs.	100	..	—	—
Tonacombe Estate Co., Ltd,	500	..	225	—
Udugama Tea & Timber Co., Ltd.	50	...	...	—
Union Estate Co., Ltd.	500	..	110	—
Upper Maskeliya Estates Co., Ltd.	500	..	—	—
Uvakellie Tea Co., of Ceylon, Ltd ,	100	60		—
Vogan Tea Co., Ltd.,	100	...	50	—
Wanarajah Tea Co., Ltd.	500	..	900	—
Yatadeniya Tea Co., Ltd.	100	—	300	..

CEYLON COMMERCIAL COMPANIES.

Company	paid p. sh.	Buyers.	Sellers.	Transactions.
Adam's Peak Hotel Co., Ltd.	100	...	30	—
Bristol Hotel Co., Ltd.	100	—	100	—
Do 7 per cent Debts	100	107	—	—
Ceylon Gen. Steam Navigation Co., Ltd	100	...	210	—
Ceylon Ice & Cold Storage Co. Ltd.	100	—	115	..
Ceylon Superaeration Ltd.	100	—	45	—
Colombo Apothecaries' Co. Ltd.	100	—	135	270 DIV.
Colombo Assembly Rooms Co., Ltd.	20	15	..	
Do prefs.	20	...	..	—
Colombo Fort Land and Building Co., Ltd.	100	...	82½	...
Colombo Hotels Company	100	—	280	—
Galle Face Hotel Co., Ltd.	100	...	2[illegible]0	195
Kandy Hotels Co., Ltd.	100	130	135	—
Kaluganga Nav. Co. Ltd.	60	...	—	—
Mount Lavinia Hotel Co., Ltd.	500	—	300	—
New Colombo Ice Co., Ltd.	100	..	135	—
Nuwara Eliya Hotels Co., Ltd.	30	--	—	—
Do 7 per cent prefs.	100	..	...	—
Public Hall Co., Ltd.	10	10	—	—

LONDON COMPANIES

Company	paid. p. sh.	Buyers.	Sellers.	Transaction
Alliance Tea Co., of Ceylon, Ltd.	10	..	8—9	—
Anglo-Ceylon General Estates Co	100	...	55—60	—
Associated Estates Co., of Ceylon	10	..	1½—2½	—
Do. 6 per cent prefs	10	..	3—5	—
Ceylon Proprietary Co.	1	.	¼—½	—
Ceylon Tea Plantation Co., Ltd.	10	..	23¼—24	—
Dimbula Valley Co., Ltd.	5	..	5—5½	—
Do prefs	5	—	5—6	—
Eastern Produce & Estates Co. Ltd.	5	...	3½—3¾	—
Ederapolla Tea Co., Ltd	10	...	6—8	—
Imperial Tea Estates Co., Ltd.	10	...	4 4½	—
Kelani Valley Tea Assen., Ltd.	5	...	3—5	—
Kintyre Estates Co., Ltd.	10	...	6-8	—
Lanka Plantations Co., Ltd	10	..	4	—
Nahalma Estates Co.,Ltd.	1	...	nom	..
New Dimbula Co., Ltd.	1	...	2¾—3	..
Nuwara Eliya Tea Estate Co., Ld.	10	—	9½	—
Ouvah Coffee Co., Ltd.	10	..	6—7	—
Ragalla Tea Estates Co., Ltd.	10	.	11-13	—
Scottish Ceylon Tea Co.,Ltd.	10	.	10—15	—
Spring Valley Tea Co., Ltd.	10	...	2—5	—
Standard Tea Co., Ltd.	6	..	10—12	..
The Shell Transport and Trading Company, Ltd.	1	...	2⅞—3⅛	..
Ukuwella Estates Co., Ltd.	25	—	par	
Yatiyantota Ceylon Tea Co., Ltd.	10	—	5¼	...
Do. pref. 6 o/o	10	.	9—10	..

BY ORDER OF THE COMMITTEE.

Colombo, May 9th, 1902.

* Latest London Prices

RAINFALL RETURN FOR COLOMBO.

(Supplied by the Surveyor-General.)

	1897.	1898.	1899.	1900	Av of 32yrs.	1901	1902
	Inch	Inch	Inch.	Inch.	Inch.	Inch.	Inch
January ..	3·81	2·32	6·98	3·72	3·24	11·91	1·95
February ..	1·68	1·98	2·78	0·63	1·89	3·55	4·57
March ..	3·66	4·21	0·88	3·71	4·75	5·12	6·85
April ..	10·97	22·81	6·66	15·12	11·43	8·71	10·01
May ..	8·30	5·80	17·73	10·63	12·04	6·28	0·82*
June ..	10·14	10·94	9·23	7·83	8·35	5·93	
July ..	5·24	6·15	1·11	6·77	4·30	4·52	
August ..	9·09	0·97	0·62	7·35	3·79	0·46	
September ..	4·58	6·90	1·48	4·00	4·98	3·93	
October ...	4·71	20·60	12 99	9·47	14·36	3·91	
November ..	11·66	17·38	8·58	9·25	12·55	19·84	
December ..	8·89	3-05	4·44	5·20	6·35	1·70*	
Total..	82·73	103·11	73·48	83·68	88·03	75·86	24·20

* From 1st to 6th May. 0·82 inch, that is up to 9-30 a.m on the 7th May.—ED. CO.

CEYLON TEA: MONTHLY SHIPMENTS TO UNITED KINGDOM AND ESTIMATE.

Estimate	for	April	1902—9 to 9½ mil. lb.
Total Shipments		Do	1902—9,000,000
Do	Do	Do	1901—8,474,940
Do	Do	Do	1900—8,924,218

[ESTIMATE for May 1902—10½ to 11 million lb.]

THE DEAF HEAR.—No. 479 of *the Illustrated World* of 626, Chiswick High Road, London, W., England contains a description of a remarkable Cure for Deafness and Head Noises which may be carried out at the patient's home, and which is said to be a certain cure, This number will be sent free to any deaf persons sending their address to the Editor,

COLOMBO PRICE CURRENT.

(Furnished by the Chamber of Commerce.)

EXPORTS

Colombo, May 5th, 1902.

CARDAMOMS :—
- All round parcel, well bleached per lb. R1·05
- Do. dull medium do. R0·90
- Special assortment, 0 and 1 only do. R1·40
- Seeds do. R1·10

CINCHONA BARK :—
- Per unit of Sulphate of Quinine 10c—1½ at 3 per cent.

CINNAMON :—
- Ordinary assortment per lb. 53c.
- Nos. 1 and 2 only per lb. 58c.
- Nos. 3 and 4 only per lb. 47c.

CINNAMON CHIPS :—
- Per candy of 560 lb R70·00

COCOA :—
- Finest estate red; unpicked per cwt R42·50
- Medium do do R35·00
- Bright native unpicked and undried R32·50
- Ordinary do do do R25·00

COCONUTS—(husked).
- Selected per thousand R57·00
- Ordinary ,, R47·00
- Smalls ,, R40·00

COCONUT CAKE—
- Poonac in robins f. o. b. per ton R82·50
- Do in bags none.

COCONUT (Desiccated).
- Assorted all grades per lb 21c

COCONUT OIL—
- Dealers' Oil per cwt R20·00.
- Coconut Oil in ordinary packages f. o. b. per ton R425·00. Sellers R415 refused

COFFEE.—
- Plantation Estate Parchment on the spot per bus. R11·50
- Plantation Estate Coffee f. o. b. (ready) per cwt.— None.
- Native Coffee, f.o.b per cwt.—None.

CITRONELLA OIL—
- Ready do per lb.—45c

COPRA—
- Boat Copra per candy of 560 lb. R62·00
- Calpentyn Copra do do R63 00
- Cart do do do R58·00
- Estate do do do R63·00

CROTON SEED per cwt—R11·00

EBONY—
- Sound per ton at Govt. depot—R180·00.—Sales of the 7th April.
- Inferior R90·00.—Sales of the 7th April.

FIBRES—
- Coconut Bristle No. 1 per cwt None
- Do ,, 2 None
- Do mattress ,, 1 None
- Do ,, 2 None
- Coir Yarn, Kogalla ,, 1 to 8 16·00
- Do Colombo ,, 1 to 8 10·50
- Kitool all sizes None
- Palmyrah None

PEPPER—Black per lb None

PLUMBAGO—
- Large lumps per ton R675
- Ordinary lumps do R650
- Chips do R450
- Dust do R300
- Do (Flying) do R150

SAPANWOOD— per ton R35·00

SATINWOOD (ordinary) per cubic ft. R4·00
- Do (Flowered) per cubic ft. R17·00

TEA—	High Grown Average.	Medium Average.	Low Grown Average.
	cts	cts	cts
Broken Pekoe per lb	63	48	39
Orange Pekoe do	52	38	34
Pekoe do	46	37	30
Pekoe Souchong do	44	33	29
Pekoe Fannings do	32	30	27
Broken mixed—dust, &c	26	24	24

CEYLON EXPORTS AND DISTRIBUTION FOR SEASONS 1901 AND 1902.

COUNTRIES	Black Tea. 1902 lbs.	Black Tea. 1901 lbs.	Green Tea. 1902 lbs.	Green Tea. 1901 lbs.	Coffee—cwts. Plantation	Coffee—cwts. N'tive	Coffee—cwts. Total.	Cocoa cwts.	C'moms lbs.	Cinnamon Bales. lbs.	Cinnamon Chips. lbs.	Coconut Oil. 1902 cwt	Coconut Oil. 1901 cwts	Copra cwts.	Desiccated Coconut lb.	Poonac. cwts.	Coconuts. No.	Plumbago. 1902 cwts	Plumbago. 1901 cwts.
U K.	32438218	36232855	117336	..	2369	..	2369	14954	139013	116656	74441	54653	46504	7232	2058369	21	3459515	72211	48531
,, Austria	7148	16975	..	..	1	..	1	...	...	5600	39800	1701	772	...	36100	...	5000	...	..
,, Belgium	27386	5961	...	..	31	..	31	375	...	36100	66640	1198	1994	4903	88820	24695	60040	4300	4003
,, France	84872	131505	...	..	2	...	2	63	448	25800	6600	...	..	16937	...	...	56020	..	..
,, Germany	149878	91227	...	..	...	..	...	1345	40109	238350	262001	3364	..	30053	453155	16827	42·905	16895	14022
,, Holland	3190	11174	...	..	...	..	..	..	..	13500	113400	..	..	..	81250	..	..	203	...
,, Italy	4590	5585		..	..	..	..	32	435	44100	75992	1310	200	...	...	10	3760	..	...
,, Russia	3417878	3312976	32210	..	2	...	2	...	72	130	..	...	..	17036	..	..	...	1240	2471
,, Spain	2250	–	..	...	...	..	..	..	..	68000	26100	..	..	...	..	..	...	...	...
,, Sweden	30642	19534	...	..	..	..	..	300	...	..	..	...	199	...	..	..	..	...	...
,, Turkey	12813	13266	..		...	...	..	..	..	..	...	...	...	..	...	...	..	..	...
,, India	223152	539034	9780	3840	63	...	63	1	32921	...	2240	24940	23336	...	...	...	14400	1582	1158
,, Australia	5521015	6549401	..	...	1210	...	1210	206	...	2700	6608	..	94	...	198201	...	..	89	132
,, America	1587690	924690	255735	12010	535	..	535	...	1925	65000	4315	15863	7007	...	427220	...	...	103822	56995
,, Africa	190215	76098	..	..	2	..	2	.	1776	..	..	60	76	..	12200	1	385581	..	...
,, China	907281	63896	...	...	10	...	10	3100	5101	200	112	...	707	..	...	..	–	637	..
,, Singapore	38490	45016	...	...	1	..	1	809	300	...	..	...	...	...	...	...	...	...	...
,, Mauritius	26300	8590	..	...	48	..	48	..	..	..	..	...	..	...	..	..	..	..	..
,, Malta	128575	126630	..	...	...	...	–	...	..	...	..	..	..	..	...	..	..	...	..
Total export from 1st Jan to 5th May 1902	44811483	48749441	415061	15850	4274	..	4274	21185	222100	616044	658849	103089	81388	76161	3356115	41554	4413221	200979	126312

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Price Current, London, March 26th, 1902.)

	QUALITY.	QUOTATIONS
ALOES, Soccotrine cwt.	Fair to fine dry .	70s a 80s
Zanzibar & Hepatic ,,	Common to good ..	20s a 60s
ARROWROOT (Natal) lb.	Fair to fine ..	5½d a 6¾d
BEES' WAX, cwt.		
Zanzibar & Bombay White ,,	Good to fine	£6 a £7 10s
Zanzibar & Bombay Yellow ,,	Fair ,,	£6 a £6 12s 6d
Madagascar ,,	Dark to good palish	£6 10s a £6 17s 6
CAMPHOR, Formosa ,,	Crude and semi-refined	165s a 185s
Japan ,,	Fair average quality ..	175s a 180s
CARDAMOMS, Malabar lb.	Clipped, bold, bright, fine	1s 9d a 2s
	Middling, stalky & lean	1s 2d a 1s 7d
Ceylon. Mysore ,,	Fair to fine plump ..	1s 2d a 3s 2d
	Seeds .	1s 6d a 1s 9d
,, Tellicherry ,,	Good to fine ..	1s 6d a 2s
	Brownish .	1s 3d a 1s 6d
,, Long ,,	Shelly to good ..	9d a 1s 9d
,, Mangalore ,,	Med brown to good bold	2s 3d a 3s 3d
CASTOR OIL, Calcutta ,,	1sts and 2nds ..	3¼d a 3½d
CHILLIES, Zanzibar cwt.	Dull to fine bright ...	35s 6d a 40s
CINCHONA BARK.— lb.	Ledgeriana Orig. Stem	6d a 9d
Ceylon	Crown, Renewed	5d a 7d
	Org. Stem	3½d a 7d
	Red Org. Stem	3⅜d a 4¼d
	Renewed	3d a 5¾d
	Root	3¾d a 4d
CINNAMON, Ceylon 1sts per lb	Ordinary to fine quill	8½d a 1s 6d
2nds	,, ,,	8d a 1s 6d
3rds	,, ,,	7½d a 1s 4d
4ths	,, ,,	7d a 11d
Chips	,, ,,	2½d a 10d
CLOVES, Penang lb.	Dull to fine bright bold	5½d a 9½d
Amboyna ..	Dull to fine	4½d a 6d
Zanzibar and Pemba	Good and fine bright	3 13-16d a 4¼d
	Common dull to fair	3⅜d a 3¾d
Stems ..	Fair	1d
COFFEE		
Ceylon Plantation ,,	Bold to fine bold colory	92s 6d a 122s
	Middling to fine mid ..	80s a 108s
	Low mid. and low grown	
	Smalls	40s a 60s
Native	Good ordinary	40s a 55s
Liberian ,,	Small to bold	30s a 40s
COCOA, Ceylon ,,	Bold to fine bold	62s a 80s
	Medium and fair	58s a 62s
	Native	51s a 60s 6d
COLOMBO ROOT ,,	Middling to good	7s a 14s
COIR ROPE, Ceylon ton		nominal
Cochin ,,	Ordinary to fair ..	£13 10s a £18
FIBRE, Brush ,	Ord. to fine long straight	£16 a £19
Cochin ,,	Ordinary to good clean	£20 a £24
Stuffing ,,	Common to fine	£7 a £9
COIR YARN, Ceylon ,,	Common to superior	£15 a £30
Cochin ,,	,, ,, very fine	£12 a £32
do. ,,	Roping, fair to good	£10 a £14 10s
CROTON SEEDS, sift. cwt.	Dull to fair	15s a 25s 6d
CUTCH ,, ,,	Fair to fine dry	23s a 35s
GINGER, Bengal, rough ,,	Fair	40s
Calicut, Cut A ,,	Good to fine bold	80s a 90s
B & C ,,	Small and medium	48s a 70s
Cochin Rough ,,	Common to fine bold	35s a 42s 6d
	Small and D's	3 s 6d a 34s
Japan ,,	Unsplit	37s 6d a 40s
GUM AMMONIACUM ,,	Sm. blocky to fine clean	15s a 30s
ANIMI, Zanzibar ,,	Picked fine pale in sorts	£10 7s 6d a £18
	Part yellow and mixed	£7 a £9
	Bean and Pea size ditto	70s a £9 2s 6d
	Amber and dk. red bold	£5 10s a £6 7s 6d
	Med. & bold glassy sorts	80s a 120s
Madagascar ,,	Fair to good palish ...	£4 a £8
	,, ,, red ...	£4 5s a £7 10s
ARABIC E. I. & Aden ,,	Ordinary to good pale	25s a 40s
Turkey sorts ,,		32s a 36s
Ghatti ,,	Pickings to fine pale ...	10s a 22s 6d
Kurrachee ,,	Good and fine pale ...	37s 6d a 42s 6d
	Reddish to pale selected	30s a 35s
Madras ,,	Dark to fine pale ...	20s a 25s
ASSAFŒTIDA ,,	Clean fr. to gd. almonds	45s a 80s
	Ord. stony and blocky	9s a 30s
KINO ,,	Fine bright	1s 3d
MYRRH, picked ,,	Fair to fine pale	80s a 115s
Aden sorts ,,	Middling to good	50s a 70s
OLIBANUM, drop ,,	Good to fine white	45s a 47s 6d
	Middling to fair	30s a 42s 6d
pickings ,,	Low to good pale	21s a 32s 6d
siftings ,,	Slightly foul to fine	19s a 23s
INDIARUBBER, Assam lb	Good to fine	2s a 2s 3d
	Common to foul & mxd.	7d a 1s 6d
Rangoon	Fair to good clean ...	2s a 2s 4d
Borneo	Common to fine	1s a 2s
INDIARUBBER (Contd.)		
Java, Sing. & Penang lb.	Foul to good clean ...	8d a 2s 3d
Mozambique ,,	Good to fine Ball ...	2s 6d a 3s
	Ordinary to fair Ball ...	1s 10d a 2s 4d
	Low sandy Ball ..	1s 3d a 1s 6d
	Sausage, fair to good ..	2s a 2s 10d
	Liver and Livery Ball ..	1s 9d a 2s 1½d
Nyassaland	Fair to fine ball ..	2s 3d a 2s 9¼d
Madagascar	Fr to fine pinky & white	2s a 2s 5½d
	Fair to good black ..	1s 3d a 1s 9d
	Niggers, low to fine .	7d a 2s
INDIGO, E.I.	Bengal—	
	Shipping mid to gd violet	3s 4d a 4s
	Consuming mid. to gd.	3s a 3s 3d
	Ordinary to mid.	2s 10d a 3s
	Mid. to good Kurpah	1s 6d a 2s 1d
	Low to ordinary	1s a 1s 5d
	Mid. to good Madra	1s 10d a 2s 3d
MACE, Bombay & Penang per lb.	Pale reddish to fine	2s a 3s
	Ordinary to fair	1s 4d a 1s 1d
	Pickings	1s 3d a 1s 4d
MYRABOLANS, Madras cwt	Dark to fine pale UG	5s a 6s
	Fair Coast	4s 6d a 5s
Bombay ,,	Jubblepore	4s 6d a 5s 6d
	Bhimlies	4s a 7s
	Rhajpore, &c.	3s 6d a 5s 6d
Bengal ,,	Calcutta	3s 6d a 5s
NUTMEGS— lb.	64's to 57's	2s 6d
Bombay & Penang ,,	110's to 65's	1s 1d a 2s 5½d
	160's to 115's	6d a 1s
NUTS, ARECA cwt.	Ordinary to fair fresh	20s a 25s
NUX VOMICA, Bombay per cwt.	Ordinary to middling	5s 6d a 6s
Madras	Fair to good bold fresh	7s a 19s
	Small ordinary and fair	5s a 6s 9d
OIL OF ANISEED ,,	Fair merchantable	4s 4d a 4s 4½d
CASSIA ,,	According to analysis	2s 6d a 2s 10d
LEMONGRASS ,,	Good flavour & colour	6d
NUTMEG ,,	Dingy to white	1½d a 3d
CINNAMON ,,	Ordinary to fair sweet	3¼d a 1s 6d
CITRONELLE ,,	Bright & good flavour	9½d a 10d
ORCHELLA WEED—cwt		
Ceylon ,,	Mid. to fine not woody..	10s a 12s 6d
Zanzibar. ,,	Picked clean flat leaf ..	10s a 14s
	,, wiry Mozambique	10s a 11s
PEPPER - (Black) lb.		
Alleppee & Tellicherry	Fair to bold heavy ..	5¾d a 6d
Singapore ..	Fair	5¾d
Acheen & W. C. Penang	Dull to fine	5½d a 6⅛d
PLUMBAGO, lump cwt.	Fair to fine bright bold	30s a 35s
	Middling to good small	20s a 28s
chips	Dull to fine bright ..	9s a 15s
dust	Ordinary to fine bright	4s 6d a 8s 3d
SAFFLOWER	Good to fine pinky .	65s a 75s
	Inferior to fair .	40s a 60s
SANDAL WOOD—		
Bombay, Logs ton.	Fair to fine flavour ..	£15 a £30
Chips ,,	... ...	£5 a £8
Madras, Logs ,,	Fair to good flavour ..	£15 a £30
Chips ,,	Inferior to fine ...	£4 a £8
SAPANWOOD Ceylon ,,	Fair to good ..	£5 a £5 10s
Manila ,,	Rough & rooty to good	£4 10s a £5 15s
Siam ,,	bold smooth...	£7
SEEDLAC cwt.	Ord. dusty to gd. soluble	115s a 120s
SENNA, Tinnevelly lb	Good to fine bold green	5d a 8d
	Fair greenish	3½d a 4d
	Common dark and small	½d a 3d
SHELLS, M. o'PEARL—		
Bombay cwt.	Bold and A's	£1 a £5 10s
	D's and B's	
	Small ...	
Mergui ,,	Small to bold ..	£6 7s 6d a £7 17s 6d
Mussel ,,	Small to bold ...	22s a 55s
TAMARINDS, Calcutta...	Mid. to fine bl'k not stony	8s a 10s
per cwt. Madras	Stony and inferior ..	4s 6d a 6s
TORTOISESHELL—		
Zanzibar & Bombay lb.	Small to bold dark mottle part heavy	16s a 22s 6d
TURMERIC, Bengal cwt.	Fair ...	16s a 16s 6d
Madras ,,	Finger fair to fine bold bright	17s a 22s.
	Bulbs ..	13s a 17s
Do. ,,	Finger ..	16s 6d a 18s
Cochin ,,	Bulbs ...	11s a 11s 6d
VANILLOES— lb.		
Mauritius .. 1sts	Gd. crysallized 3½ a 9 in	5s 3d a 20s 6d
Bourbon ... 2nds	Foxy & reddish 3½ a 8 ,,	5s a 16s
Seychelles 3rds	Lean and inferior ...	3s a 4s 9d
VERMILION lb.	Fine, pure, bright ...	3s 1d a 3s 3d
WAX, Japan, squares cwt	Good white hard ...	34s 6d a 35s

THE
AGRICULTURAL MAGAZINE,
COLOMBO.

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for May :—

Vol. XIII.] MAY, 1902. [No. 10.

TWO USEFUL VEGETABLES.

THERE are being introduced into our villages through the School Gardens, two useful and wholesome vegetables which, though common enough in India, are not grown in Ceylon; and as little is known about them, we append the following notes regarding their uses for the benefit of our readers:—

1. *Rumex Vesicarius.*—Sorrel, Bladder Dock (*Polygonaceæ*). This is an annual monœcious herbaceous plant, 6 to 12 inches high, with succulent leaves and leaf-stalks, inclined to branch moderately, with a characteristic acid sour taste, and a flavour of rhubarb about it.

Watt gives the following note regarding the medicinal properties of the plant:—

"The juice of the plant is considered by natives to be cooling and aperient, and, to a certain extent, diuretic (*Ainslie*). It is used to allay the pains of toothache, and from its astringent properties it is supposed to check nausea. The whole herb is given internally to allay burning at the pit of the stomach and to improve the appetite. Externally a pulp formed of its bruised leaves is applied to the skin to allay the pains of bites of reptiles and the stings of scorpions. The seeds are said to have similar properties, and are besides prescribed roasted in dysentery. The root also is medicinal (Dymcock)."

The plant is cultivated as a vegetable almost throughout India, and is used by the natives both in the raw and cooked state. It is usually grown in patches near wells, and may be procured almost all the year round.

We are inclined to think that the plant will prove of great value to the natives both owing to its manner of growth and its uses. Watt gives the word *Súri* as its Sinhalese name, but we can find no reference to the plant in any local works on Botany, nor can we give any explanation of the origin of the word *Súri*. One thing is certain, however, and that is that the plant is not found in use nor under cultivation in the Island.

For native preparations both leaves and stalks are well suited, a vegetable curry made of the latter being particularly tastety. The same parts may also be used to take the place of rhubarb in tarts, as the rhubarb flavour, previously referred to, predominates in the petioles. The leaves themselves go to make a really excellent jam.

The plant in its early stages adopts the rosette form of growth, as in the lettuce, though the leaves always have fairly long petioles—the leaves themselves being somewhat cordate in shape. Later on, as noted above, a system of branching follows, the branches being considerably thicker than the leafstalks and possessing more of the sour taste and rhubarb flavour. When the leaves are cut for use, the plant continues to put out a fresh growth, a characteristic that goes to enhance the value of the plant which may be described as a hardy grower.

Altogether we consider *Rumex vesicarnis* a great acquisition, and trust that our village population will take to it without prejudice, and soon

come to recognize its dietic value and medicinal virtues. The plant has not flowered with us yet.

2. *Chemopodium album.*—The white goosefoot (*Chenopodiaceæ*).

The plant is found growing in the tropics at sea-level, as well as in Tibet at a height of 14,000 feet. As seen growing here it reaches a height of about 3 feet before producing its inconspicuous imflorescence.

In India the leaves and twigs are eaten as a pot-herb like spinach, but the plant is there chiefly cultivated for its grain, which is considered better than buckwheat. When cultivated during the rains it is said to attain a height of 6 feet, the seed ripening in India in October. Prof. Church says of the leaves of this plant: They are rich in mineral matters, particularly in potash salts. They likewise contain a considerable amount of albumenoids and of other compounds of nitrogen.

Watt refers thus to the medicinal virtues of this plant:—Said to be used in special diseases, and as a laxative in spleen and bilious disorders (*Atkinson*). It is also given in bile and worms (Baden-Powell). It is diobstruent and diuretic.

In the form of the favourite native dish called "mellun" it is very palatable, and would be very welcome in village households. We have no doubt it will be equally suitable for vegetable curry.

The plant is already being grown in School Gardens, and the produce formed one of the vegetables exhibited at the Danowita Village Show held on 22nd March.

OCCASIONAL NOTES.

A Boad of Agriculture and Industries has been formed in British Guiana, with the object of facilitating the work of fostering Agricultural industries other than that of Sugar-cane, of extending agricultural instruction to small farmers and settlers on the land, of imparting agricultural instruction through the Primary Schools of the Colony, and generally of developing the agricultural resources of British Guiana.

The consigument of Banana plants referred to in our last issue duly arrived from Queensland, and have already been planted out. It includes two plants of each of the following varieties:—Ladies' fingers, Sugar, Butter, Dacca, Barrego, Cavendish, Moku, Delena.

Professor MacOwan, Government Botanist at the Cape, has been invested with the degree of Doctor of Science by the Cape University. Prof. MacOwan's work in South African botany his of a valuable character, and Prof. Harvey of Kew has borne testimony to this fact by stating that but for Prof. MacOwan's great work at the Cape the "Flora Capensis" would have been miserably incomplete. We offer our hearty congratulations to Dr. MacOwan.

We are glad to find the Agricultural Journal of Cape Colony reprinting the Handbook on Practical Orchard work by Messrs. P. MacOwan and Eustace Pillans. We formed a very high opinion of this little work when it was first published, and consider it well worth bringing within the reach of all who have anything to do with the cultivation of fruit trees.

The cultivation of Cassava or Manioc (*Manihot utilissima*) is spreading rapidly in Florida and the neighbouring States. One great advantage is that the plant grows in sandy soils unsuited to most crops, and can be fertilized by means of leguminous crops without the aid of other manures. The acre is said to yield 8 tons of roots, and the starch got from it is sold for 2¼d. per lb., while it goes six times as far as the best wheat starch at 3d. per lb. As a cattle food it is a great acquisition, making it possible, so it is said, to put on a pound of carcase at the cost of a little over a ½d.

We are glad to learn that Messrs. C. C. Barber's Cocoa (see advertisement on back cover) has "taken" in Australia. It has been aacepted by approved Agents in Perth, Sydney, and New South Wales, and its introduction into Queensland and Tasmania has been entrusted to good hands. The first orders received from various quarters have been substantial and promise well for the popularizing of the excellent article turned out by the pioneer firm of Cocoa manufacturers in Ceylon, where Barber's Cocoa is steadily taking the place of the older "brands."

The following Ceylon plants are gall-bearing: Eugenia Jambolana, Areca Catechu, Cinnamomum Zeylanicum, Pongamia Glabra, Terminalia Chebula and Acacia Leucophlea. The fruit of Terminalia Chebula and T. Belerica constitute the "Gall-nuts" or Myrobalans of commerce, valuable in tanning.

A correspondent, writing on 20th March from Adelaide says:—The land is most fertile and the climate, except for two or three months, equal to that of the countries washed by the Mediterranean. During the summer, which we have just passed, the temperature keeps often over 90° F., and sometimes, for a day or so, it goes up as high as 108°; but by the laws of compensation, the Mercury falls to a temperate heat for a day or two after. There is plenty of good land to be got from Government at a rental of 2s. per acre per annum, and twenty years to pay the value in, or on a lease of 999 years at 2s. This is the paradise of the working man. Every man and woman must work, and the dignity of labour is understood here as nowhere else. Farmer and labourer have equal rights, and the man in Parliament is dependent chiefly on the working man for his election. This, in a measure, enables the working man to rule the capitalist and to control the laws of the country.

The sentiments embodied in the article on Town and Country Shows which appeared in the last number of the *Agricultural Magazine* are echoed in the *Cape Agricultural Journal.* Says our contemporary; "Let it be prominently borne in mind that

Agricultural Shows, while run in the interests of the general sight-seeing public, are especially designed to benefit and promote the farming industry. The question is, do the Shows fulfil their object in this direction?" and so on in the same strain.

We read in the report of the Government Agent of the North-Western Province (Mr. L. W. Booth) for last year, that two Cottagers' Shows were held during the year, one at Habarana and the other at Rambewa, where both attendance and exhibits were numerous. The opportunity was taken to distribute seeds to all who cared to take them.

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF APRIL, 1902.

1	Tuesday ...	Nil	17	Thursday ...	·21
2	Wednesday ..	Nil	18	Friday ...	·13
3	Thursday ...	·05	19	Saturday ...	·82
4	Friday ..	Nil	20	Sunday ...	Nil
5	Saturday ..	Nil	21	Monday ...	Nil
6	Sunday ..	Nil	22	Tuesday ..	Nil
7	Monday ...	·20	23	Wednesday...	1·66
8	Tuesday ...	Nil	24	Thursday ..	Nil
9	Wednesday ..	Nil	25	Friday ...	Nil
10	Thursday ...	03	26	Saturday ..	·44
11	Friday ...	·04	27	Sunday ...	·04
12	Saturday ..	·13	28	Monday ...	·20
13	Sunday ..	·07	29	Tuesday ...	5·65
14	Monday ...	Nil	30	Wednesday	·70
15	Tuesday ...	Nil	1	Thursday ...	·13
16	Wednesday ...	Nil			
				Total...	10·50
				Mean...	·35

Greatest amount of rainfall registered in any 24 hours on the 29th April, 1902, 5·65 inches.

Recorded by ALEX. PERERA.

COTTON.

Some years ago a good deal of attention was given to the question of Cotton Cultivation in Ceylon, but though a number of small experiments were started at the time, we are not aware that a proper trial under the most favourable conditions was given to the cultivation of the plant. With the opening of the Northern Railway the subject is once more being discussed in view of the possibility of suitable areas being found in the regions through which the new railway runs.

The amount and distribution of rainfall has much to do with successful cotton cultivation, and this fact must be borne in mind in selecting soils. The plant thrives in a very warm atmosphere, provided the latter is moist and that severe drying winds are not prevalent. In the typical cotton climate the mean daily temperature increases from the time of seeding till the plant has reached its greatest vigour and stored up all the reserve food it needs for the production and maturing of fruit. The best type of soil for producing favourable results is a clay loam or medium heavy sandy loam. The soil should be deep and the sub-soil not heavy and compact. The cotton plant has a well-developed tap-root extending according to the vigour of the plant and the character of the soil, to a depth of three or more feet. The lateral or feeding roots begin usually within three inches of the surface and seldom extend beyond a depth of nine inches. It is a question whether the practice of planting on ridges is as good as working up the land deeply and then sowing the seed on the level ground. The ridge system grew out of the practice of shallow working to a depth of a few inches, though the seed bed is deepened by trowing up the soil till a depth of ten inches or more is obtained. A good seed bed is thus formed it is true, but it will not resist drought as would a level culture accompanied by deep working.

The object of cultivating the land during growth of crop is to prevent loss of moisture in the soil. This is accomplished by maintaining a surface layer one or two inches thick in a thoroughly pulverised condition. At the same time and by the same means weeds and grass are kept down. It is very important that the surface layer of loose soil should be constantly maintained. Especially after rain when the soil tends to settle and form a compact surface, a stirring of the top layer should take place. With the production of crop, cultivation should cease, and the plant helped by reducing water supply by preventing surface evaporation. It is precisely reversing the process desired in the early stages of growth with the object of checking further developement of foliage and directing the energies of the plant towards making use of the materials it has already accumulated for the production of fruit.

As regards time of planting &c, local conditions must be consulted before deciding these points, but the object should be as far as possible to secure for the plant an early start and a long season in order to successfully mature its fruit and enable the crop to be gathered in good condition.

On the question of fertilizing or manuring we do not propose to enter, but a good deal of useful information under this head may be derived by a handy pamphlet on "Cotton Culture" published by the German Kali Works for which Messrs. Freudenberg & Co. are the local agents. This publication should prove useful to intending cotton growers as it has proved to us in collating the foregoing information.

We are hopeful of suitable land being found for raising cotton as well as tobacco, which is just at present also being much talked about, in the vast areas now made accessible by the opening of the Northern Railway. With this idea we are making arrangements for trials of suitable varieties of cotton, of which a small supply of seeds has been indented from Egypt.

We have already a local Spinning Company which ought to be some encouragement to intending growers. There is also a Sinhalese pamphlet on Cotton Cultivation compiled by Mr. W. A. de Silva which should serve to bring the subject to the notice of the natives. A revised edition of this pamphlet—brought up to date—and a Tamil translation of the same, might be published with

advantage for free circulation by the authorities interested in the developement of a local cotton-growing industry and in the opening up of the areas through which the new railway will run.

TO PRESERVE MANGO CUTTINGS.

In our February number (*vide* first article) we gave some directions for packing Mango cuttings so as to keep them fresh for budding purposes. In the *Agricultural Journal of Natal* for March the following further information on the same subject occurs:—

Mr. H. Knight, according to a recent issue of the "Queenslander," has received a report from the Department of Agriculture (Queensland) with regard to the cuttings of mango he packed at the City Market here on the 7th of September last. There were four tins. In two were eighteen cuttings packed in moist sand; in the other two were six cuttings, packed in coconut fibre, which had been boiled and washed and squeezed dry. One of the big tins was opened on the 15th of October, and it was found that fourteen of the cuttings were dead, two partly alive, and two fairly healthy. The second big tin was opened on the 12th of November. All the cuttings were dead except the largest, which was covered with nodules, but had no appearance of any buds swelling. The first of the small tins was opened on the 12th of November, and all six cuttings were alive, with numerous buds ready to develop or grown out from ½ in. to 2 in. in length, the wood covered with white nodules, and the base of the cuttings well calloused. The last tin was opened on the 19th of December. In this case, also, the whole of the cuttings were alive. They had made shoots of from 2 in. to 4 in long, and all the buds appeared to have developed, though it would have been possible to get adventitious buds from the base of the larger shoots. The base of each cutting was almost completely calloused over. Mr. Benson, who examined the cuttings, states: "I consider the two large tins a failure. Both the small tins were a complete success, and proved conclusively that mango wood can be successfully sent long distances if carefully packed in tight tins filled with coconut fibre, as used by Mr. Knight." Mr. Knight is quite satisfied with the result of his experiments; but he is hopeful, now that he has demonstrated the possibility of keeping mango cuttings alive for a good length of time, that something may be done by the Department of Agriculture in the matter of introducing into Queensland some of the finer classes of the fruit that are grown in the East.

A VALUABLE TIMBER TREE.

The Editor of *Indian Gardening* referring to Mr. Herbert Stone's paper on "The Identification of Timbers" read before the Society of Arts, London, says:—"That our Indian timbers require to be more closely studied is evident. How many people, for instance, know the value of 'Gumbar,' the wood of *Gmelina arborea*, and its peculiarity of resisting the effects of time, wind and water, and its complete immunity from the attacks of insect pests? Even the voracious white ant will not touch it." The tree known as *Etdemata* is rather common in Ceylon, and its wood is described by Trimen as "yellowish-white, even-grained, light, strong, tough and durable; an excellent timber." The following note given by Dr. Watt in his Dictionary of Economic Products supplies fuller information regarding this timber which is not known popularly. Colour yellowish, greyish, or reddish-white with a glossy lustre, close and even-grained, soft, strong, does not warp or crack in seasoning, weight from 28 to 35 lbs. per cubic foot, breaking weight of a bar 6' ft. by 2 in. by 2 in., 580 lbs. (according to Baker). It is light, has a good surface, is very durable, is easily worked, and takes paint and varnish readily, and is therefore highly esteemed for planking, furniture, carriages, deck boats, panelling, and ornamental work of all kinds. (Gamble.) Mason states that it is largely employed by the Karens for canoes, and by the Burmans for logs. Owing to its extreme durability, it has been recommended as an excellent timber for making tea boxes, and has also attracted much attention as a very suitable wood for furniture, picture frames and similar work in which shrinking and warping has to be avoided.

Buchanan mentions that it is much employed for making native instruments of music. Roxburgh appears to have first noticed the excellence of the timber. He applied various tests to prove this. In one case he placed an outside plank in the river, a little above low water mark, where the worm is supposed to exert its greatest powers. After three years in this position it was cut and found to be sound and in every way as perfect throughout as it was when first put into the river. Amongst other things a flood door was made of it to keep the tides out of the Botanic Gardens. Seven years and a half after the door (4 ft. square) was made, it still remained good though exposed to sun and water, while similar doors of teak were much decayed after six years' use.

Dr. Watt mentions that the wood has come prominently into notice and is in considerable demand in Calcutta for furniture making.

We have no doubt that Mr. Fredrick Lewis' forthcoming work will contain a reference to this tree, and supply all the information that may be desired from a local point of view.

VETERINARY NOTES.

Experiments are in progress in the treatment of Tetanus by subcutaneous injections of fresh nervous substance. Prof. Shindelka, after having unsuccessfully experimented with rabbit brain tried sheeps' brain. The fresh cerebral substance was triturated in a strong proportion of sterilised water and the emulsion injected under the skin. This treatment was applied to eight horses suffering from tetanus, and seven of these recovered; one died on the fourth day. Prof. Shindelka intends to continue his exper-

ments, and as soon as he has tried them on a sufficiently large number of animals will communicate his results.

In spite of the doubt cast by certain practitioners on the efficacy of iodide of potassium, Mr. Hauptmann is firmly convinced of its good effects. He does not favour injection in the udder chiefly owing to the difficulty of managing an antiseptic solution, but recommends administration by the mouth. Injection of an iodide solution into the uterus produced the same good results. Iodide of potassium, according to Mr. Hauptmann, exercises its specific action on milk fever as soon as it reaches the blood current.

Professor Mucki reports good results with the treatment of a severe case of strangles by means of corrosive sublimate. He used the drug intravenously, and first made an injection of 30 grammes of a solution of 1 in 1,000 in the left jugular. On the following day the temperature fell, but the hyperthermia returning two days later, the Professor administered 40, 50, and finally 60 grammes of the same solution daily. In a few days the fever finally disappeared, the local injuires improved, and the horse became quite convalescent.

The *Veterinary Journal* for February last contains a reprint of a lecture by Prof. Macqueen in which reference is made to, what we might call for the want of a better word "upishness" of young Veterinary Surgeons. The Professor objects to the insertion of the letters "M.R.C.V.S. *L.*" after a Veterinary Surgeon's name, as suggesting something more than nonsense, and states that the final *L.* should be dispensed with on the ground of bad taste and of being altogether superfluous. Another thing objected to is the use of the word "Professor." "So for as I am concerned," says Prof. Macqueen, "the name of *Professor* is not pleasing, and I should certainly live quite happily in this world if there was no such title. My conception of a Professor is a man of about 80 years of age, with a head like Lord Kelvin, with flowing locks like those worn by the late Joseph Gamgee, a man who has lived through various places in a profession, whose experience is beyond question, and who is entitled to the real dignity of being called a Professor. What would Prof. Macqueen say to the local abuse of the word "Doctor" in describing a Veterinary Surgeon?

Even the Veterinary profession is threatened with an invasion by the weaker sex. In 1897 a lady sat for and successfully passed the preliminary examination and entered as a student of a Scotch College with a view to being enrolled on the register of the R.C.V.S. She, however, found that the Council declined to admit her to examination. Legal proceedings followed against the R.C.V.S. in the Scottish Courts, but the case was dismissed with costs on the plea that the Scottish Courts had no jurisdiction. So ended the episode of the lady student. There is said to be only one qualified lady Veterinary student in Europe, viz., Mdlle. Kepereaitsch, member of a wealthy Russian family. In America, however, five ladies were enrolled as students in 1897 by the New York Veterinary College. More ladies are seeking admission, with a view it is said of qualifying to treat—*Household Pets!*

AN AGRICULTURAL PAPER.

We give below an Agricultural Examination paper with answers—something for our readers to think about.

Q. Are you aware that plant food exists in the soil in both available and unavailable forms, and that when plants have used up most of the available portion we call the soil "worn out?"

A. Yes. That soils, though unproductive, contain plant food in large quantities, but it is in such condition that plants cannot get it.

Q. Is it true that a soil is capable of being made a laboratory in which changes will take place, and some of this unavailable plant food be made as available?

A. It is only when the soil is in such condition that certain changes can take place, that the unavailable plant food becomes available to the plant.

Q. Are you aware that when the texture of your soil is poor, or, in other words, when your laboratory is out of order, the best manure will not give satisfactory results?

A. The texture or physicial condition of the soil is of the first importance. A rock contains plant food, but it will not grow crops because of its physical and chemical condition.

Q. Do you know that heat and air are important agencies in the changes going on in the soil as they are in ordinary fermentation.

A. Chemical changes in the soil cannot take place to the best advantage when air is excluded, or when a favourable temperature cannot be maintained.

Q. Does standing water have a detrimental or beneficial effect on the heat and air, Why?

A. Detrimental because it keeps the temperature low, and at the same time excludes air; while the soil texture is also impaired.

Q. How can you make the soil laboratory do the best work?

A. By making and preserving the best physical conditions possible.

Q. Have you realized what an inch of rainfall means?

A. It means about 113 tons of water supplied the acre.

Q. Are special precautions necessary for preserving the moisture in the soil? Why?

A. Most decidedly. It requires about 300 tons of water to produce one ton of dry matter. A good deal of rain water flows away over the surface of land, and a good deal is evaporated. On this account only a part of the rain is available for

plants; so we must try to save what moisture is already in the soil through previous rains.

Q. How can we make soil moist or keep soil moist?

A. By surface tillage. It keeps a soil moist by preventing it from drying out. When soil is left undisturbed for a long time, and becomes packed down, the moisture in the soil works towards the surface and is evaporated, so passing off into the air. Tillage, or stirring the top layer, make a surface soil mulch through which the soil moisture cannot pass. It is really equivalent to covering the soil with a layer of straw or board. Every cultivator knows how moist it is under a pile of straw which has remained in a place for some time, or under a board. The straw or board does not make the soil moist but prevents it from drying. This is what surface tillage does.

THE ENTOMOLOGY OF THE HOUSE FLY.

The house fly, like the poor, is always with us, and it would be to the advantage of everyone to know all about so familiar an insect, and what its power for good and evil are.

In the *Agricultural Journal of Cape Colony* Mr. Charles Loundsbury contributes, under the head of Entomology, an interesting paper on "the house fly," containing a good deal of information which it is desirable we should add to our knowledge of human things.

Mr. Loundsbury gives us an instance of the ignorance prevailing on such a common subject. He says: I once met a man who was kindly disposed towards the house fly, who confessed to a fondness for its company akin to that felt for the trusting robin red-breast that comes to the door-step at home when snow covers the ground, who was not annoyed when an over-adventurous fly dropped into his coffee, and who never exerted himself to destroy the busy ones which strove to share his sugar. His house was kept scrupulously clean, and flies consequently were not numerous therein, or he might perhaps have held different views concerning these little buzzing guests. He told me he honoured the fly for its intelligence, for its extraordinary vision and the beauty of its complex eye structure, and, most of all, for its peculiar attachment to the habitations of man throughout the wide world. He seemed well acquainted with the creature as a fly and in the house, but, strange to say, he had never probed its earlier history or enquired into its out-door habits; and his respect for the little insect seemed so genuine and unaffected that I forbore from enlightening him. Ignorance to him was indeed bliss. And if any of my readers hold similar views, if they have any affection at all for the house fly and desire to retain it, they had best read no further. My design in penning these notes is to malign the little pest, to lay bare its iniquity, to brand it an abomination of the vilest type, and to instil loathsomeness toward it. I have only one pronounced feeling for the house fly, and that is of deep disgust. Other creatures there are plenty of an equally offensive production, but the house fly is pre-eminent for habitually insinuating its low-bred filthy self into man's abode, by fouling our food and drink with its dung-stained feet, by soiling our all with its flecks of excrement, scattering germs of foul disease for our injury.

We are reminded of the fact that though we abhor many an insect with little reason, chiefly on sentimental grounds, we are in a great measure indifferent to the filth-bred house fly to comman in our dwellings, thronging eating rooms, swarming in baker's shops and meal stalls, and blackening over the baskets of sellers of sweet meats which our children are permitted to eat.

The number of distinct (described) species of flies is said to be 40,000. Of all the number, only about half a dozen habitually enter dwellings, but the most abundant by far is the one species *Musca domestica*—the universal house fly, indeed *the* "fly."

The only part of the house fly's anatomy worth describing is its mouth. This organ is described as thick throughout, extending down from the head to the ground as the fly stands in feeding, but at other times retracted out of sight. It is expanded at the end and adapted for lapping and sucking, not for piercing.

The house fly is first an elongate white egg, which hatches very quickly, sometimes in less than 8 hours, into a footless white maggot. This grows rapidly, and in about a week in warm weather is about ⅜ inch. in length when it is full grown. The maggot retracts in length, and with hard and darkened surface enters into the quiescent pupa stage. In from 5 to 7 days the fly is developed and set free.

The house fly is an all-the-year pest but is more numerous at certain seasons. The average number of eggs laid by a female is 120 per diem. The mission of the fly is that of a scavenger, and particularly so in its larval stage, but strangely enough though the fly is so common, little of an exact nature is known of its breeding places. Horse dung is believed to be the chief food of the maggots, but the dung of cattle and other animals is also freely resorted to. The maggots, not being hardy, succumb as the food dries out. They appear to thrive in pure horse dnng, other forms of ordure being too compact unless broken np or mixed with straw. The ideal breeding place would appear to be manure mixed with bedding and saturated with urine, especially if such a mixture be found in a cool shady place. Badly kept stables are their favourite haunt, and almost all stables serve as breeding places, while places where scavenged rubbish is thrown (such as over-cultivated grass fields) are very suitable. It would be well here to add that kitchen waste so commonly allowed to accumulate near dwellings is well calculated to breed the house fly.

The relation of the house fly to disease and the remedies against the pest will be referred to in our next issue.

(*To be concluded.*)

THE ADVANTAGES OF MULCHING.

[The appended lecture was delivered by Dr. Lehman, Agricultural Chemist, Mysore, before the United Planters' Association, and clearly explains the advantages of a practice too little adopted in countries subject to drought. The lecture is reproduced in Bulletin No. 2 of the Department of Agriculture Mysore, entitled "Notes on Coffee Cultivation," which in Dr. Lehman strongly recommends mulching instead of digging round the bushes.—ED. *A.M.*]

The subject is a very large one, but I shall only touch on four of the most important points. These are:—

(1) The tendency to preserve the soil moisture.

(2) The tendency to prevent the formation of a crust on the surface.

(3) The tendency to preserve the soil in a loose and open condition and retarding the growth of weeds.

(4) Allowing the rain to enter the soil more easily and preventing the surface washing.

The tendency to preserve the soil moisture.—As we all know, the top layers of soil are generally the driest, while those below are gradually increasing in moisture till the level of the sub-soil water is reached. Of course, shortly after rain this order will be partially reversed, but this will only be for a very short time. In mulched soils this is not, however, the case, as Wollney, in his elaborate experiments conducted near Munich, has clearly pointed out. He, for one found that, even after ten days of dry weather, the surface soil, under a mulch of about an inch of coarse, strawy manure, had still considerably more moisture near the surface that at a depth of four feet. Compared with unmulched soil, the differences are also very striking; especially in the first four inches of soil, as it contained 13 per cent more water than that not mulched. At a depth of two feet there were still 2 per cent in favour of the mulched soil and at three feet a little more than 1 per cent. The above is an average of several experiments; and numerous others conducted at different places on different soils and with different mulches gave similar results; boards, stones, straw and leaves were among the mulching materials used. A very loose surface soil also acts as a mulch, but on the one hand, it is not nearly so efficient as leaves and, on the other, it would soon become compact again. Nevertheless, one of the objects of cultivation is to provide this partial and temporary mulch; for in most localities the application of the only other practical mulching materials, *viz.*, straw or leaves, would prove a rather expensive operation. Since part of the object of cultivation is to form a mulch to retain soil moisture, and as a mulch of leaves would perform this object much better than cultivation, mulching may replace part of the cultivation. The more thoroughly we study the subject, the more convinced of this fact will we become. I need not enter into the theories advanced for the facts obtained by experiments notwithstanding that they have been proven beyond a doubt. It is surprising how the soil moisture will vary in adjacent portions of soil only a few feet or a few inches apart. You may have noticed yourselves that under a covering of leaves only a few feet square the soil may be moist to the very surface, while just beyond this covering the soil is perfectly dry to the touch for perhaps two feet or more from the surface. The shade under which coffee is grown has also a tendency to preserve the soil moisture. But the mulch of leaves from the shade trees will be at least quite as effective in this respect as the trees themselves. I should not like to make any remark which might induce any of you to lessen your shade; but it is just possible that after extensive experiments have been made, it would be found possible to replace part of the shade by a mulch of leaves. As far as soil moisture goes, a mulch and shade trees work in the same direction. Properly speaking, I ought to give a brief account of the functions of the water in the soil to show how far the preservation of soil moisture is an important factor. But as every one knows that a liberal supply of moisture (not stagnant water) is absolutely necessary, I need not speak of it further at present. Of course, it is possible to have too much water in the soil. But as a mulch will in no wise interfere with the drainage, and as the coffee soils do not appear to have an excessive water-holding power, it is not likely that the mulch will retain much of that which would act injuriously to the coffee. But it would tend to keep the water near the surface, where the larger portion of the roots are—at seasons when without it these portions of the soil would be too dry. Of course, experiments will have to prove in how far the wintering of coffee is desirable or necessary, and it will depend upon the results of those whether it would be desirable or not to retain the mulch through the hot and rainless season. Some planters have noticed that coffee does apparently better on stony soil than on adjacent fields which are not stony. It would be premature to say that this was due to the stones on the surface forming a partial mulch. But that stones act similarly to a mulch (though not nearly so effectively) has been proved. And that the crops are sometimes injuriously affected by removing them has also been noted by observant farmers both in England and in Germany.

Preventing the formation of a puddled surface.—The ease with which the surface soil becomes puddled in some parts of the State is very marked. Few of us realize, I believe, what a drawback this really is to plant growth. Frequently you must have noticed that plants are growing very poorly indeed if there is only a thin crust on the surface of the soil. Unfortunately, I do not remember having seen any accurately conducted experiments which would indicate the extent of the injuries done by the crust. But T. B. Terry and other practical agriculturalists claim to have more than doubled some of their crops by always stirring the soil after every shower of rain as soon as it was sufficiently dry, so as to break the crust as soon after it had formed as possible. To do this on any of your estates would be impossible. But a mulch which would break the force of the rain or drip at the surface would prevent this crust formation to a very large extent, if not altogether. The rain water after percolating through the mulch has not sufficient force to move any large

portion of soil particles and deposit them in a compact or puddled condition. One of the principal advantages of surface cultivation during the growing season of plants is doubtlessly to be found in the breaking up of the rain-puddled surface of the soil; and as a mulch will do this effectively it will greatly reduce or entirely replace the cultivation necessary on this score. In addition to surface cultivation there is always a certain amount of deep cultivation necessary. But even this can be reduced more or less by the use of a mulch, as the latter has the tendency to preserve the soil in a loose and open condition. This fact has been proven both by measuring the volume of air contained in a definite volume of mulched and unmulched soil, and by noting the shrinkage taking place in similar samples of soil mulched in various ways and those not protected by such a covering. To quote the figures without a detailed account of the experiments might be misleading. It will be sufficient to mention that in each case the mulch prevented the soil from becoming as compact as it otherwise would have become. In addition to this direct influence a mulch also tends to attract worms, which, by their burrowing, actually loosen the soil and possibly assist in rendering some of the plant food more readily available. Furthermore, any of the mulch decaying supplies the soil with vegetable mould at the surface, the place where it is so much needed. You will have noticed the check that a mulch has on weeds. And it is self-evident that a loose soil with no crust and a moist surface will allow the rain to enter more readily and will suffer less from surface washing.

GENERAL ITEMS.

The neglect of the ground or pea-nuts in Ceylon is to say the least of it remarkable, seeing that it is well suited to most parts of the Island. In America during a fair year the ground nut crop averages 5,000,000 bushels, and that is only a small proportion of the world's crop of fully 25,000,000. The Americans eat about 4,000,000 bushels of nuts a year, either in candy or the original kernels. The nut is largely used to adulterate Coffee and Cocoa.

Ground-nut oil, which is perhaps the most valuable product of the plant, is of a pale straw colour, very thin, clean and tasteless. It does not become rancid and even improves with keeping. The yield is variously stated to be from 16 to 30 per cent, the higher quantity being assisted by heat but determined in quality. Its largest use is in adulterating olive oil, while it is also used for sewing machines and small machinery, for soap-making and as a cooking oil, also for burning. The residue or cake is used as a milk-yielding cattle food as well as a manure.

Some time ago attention was drawn to the value of the parched nuts as a diet for consumptive patients. The taste for parched nuts is so universal in America that a ground-nut stand is to be seen at nearly every street corner in the large towns. *The Cape Colony Agricultural Journal*, to which we are indebted for the above notes, makes a plea for the cultivation of the ground-nut along the Eastern Coast lands.

In composition the white of egg consists of proteid matter dissolved in water, while the yolk contains in addition to proteid, fat and coloring matter. The results of analysis are as follows:—*White:* 85·7 water, 12·6 proteid, ·25 fat and ·59 ash. *Yolk:* 50·9 water, 16·2 proteid, 31·75 fat, 1·09 ash. *White and Yolk together:* 73·7 water, 14·8 proteid, 10·5 fat, 1·0 ash.

A correspondent of the *Natal Agricultural Journal* gives the following recipe which he has found most successful for mange in dogs: Wash the skin first with warm water and soap (whale oil or Carbolic is preferable). Then apply 4 oz. of whale oil, 1 drachm of creosote, 1 oz. sulphur. Grind the sulphur into a little oil and creosote and then gradually add the rest of the tar and oil. Rub thoroughly into the skin.

Pergularia odoratissima, known among the Chinese as the "Night-Scented Orchid" is what is called the "tonkin creeper" in Ceylon. It is, of course, not an orchid, but a member of the order Asclepiadaceae. The flower is a great favourite among older members of the Ceylonese population, and is often placed among articles of clothing owing to the scent it imparts. An attar is said to be extracted from the blossoms. The fruit is incorrectly supposed by some to be the scented bean called "Tonka" or "Tonga" which is borne by *Dipteryx odorata*, a leguminous plant and the seed of which is used to scent snuff and communicate a pleasant odour to clothing.